AVIATION WEEK

SEPT. 28, 1953

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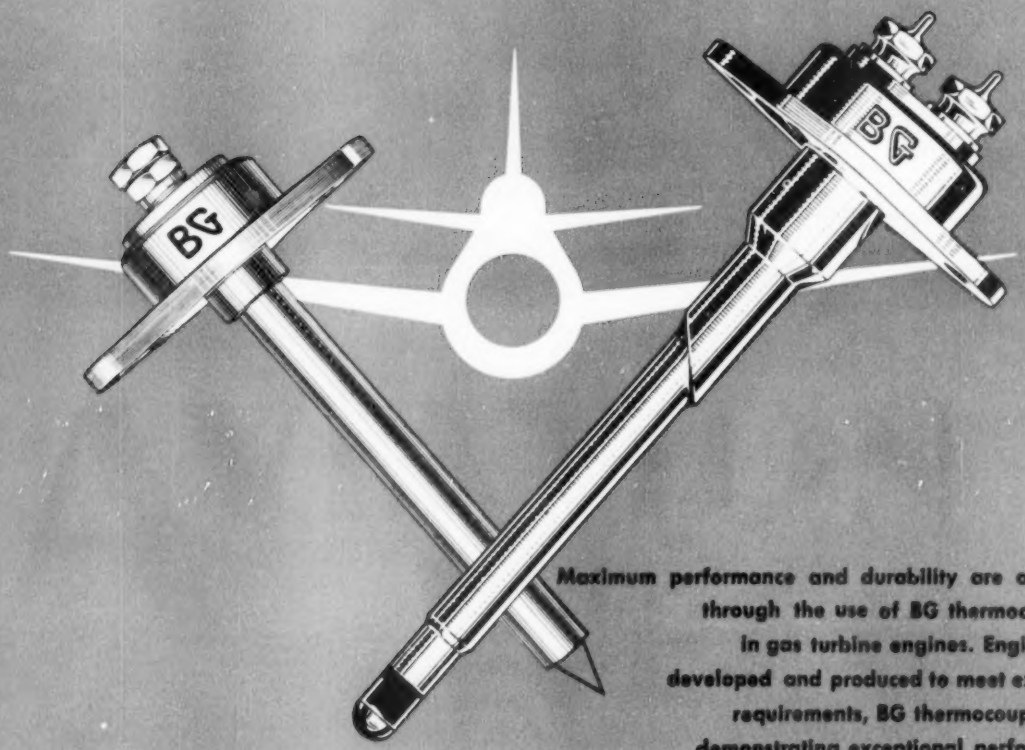

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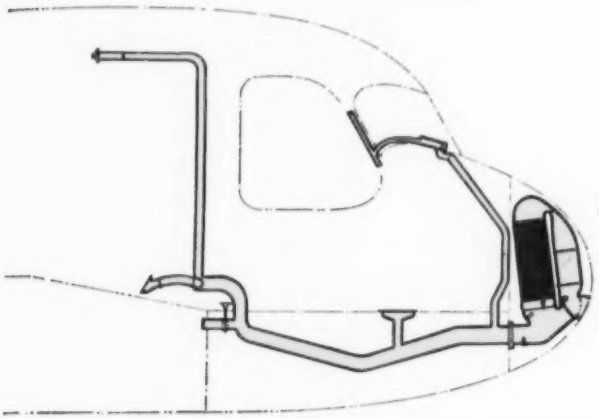

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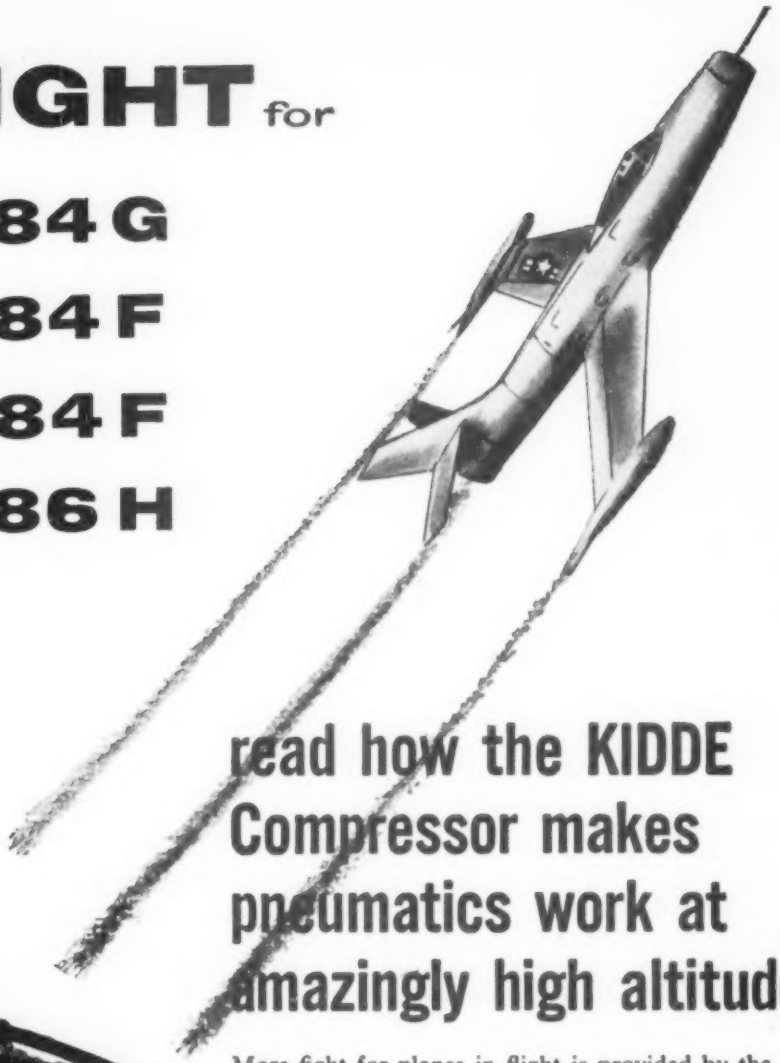

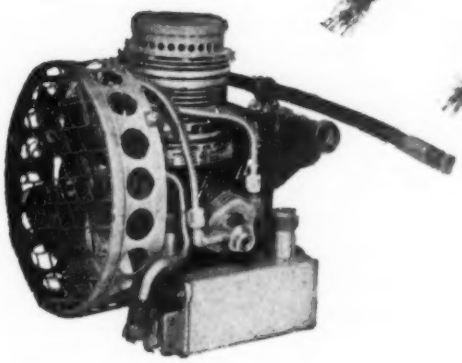

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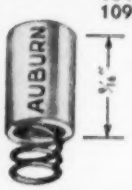

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Aviation Week

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Pioneer Airliner–1919

The Lawson Airliner was built at Milwaukee, Wisconsin, in 1919 with V. J. Burnelli (left) in charge of design and construction. Designed to carry 26 passengers, it was the first airliner developed after World War I that was not based on a converted bomber design. And today, Burnelli is still vitally interested in aviation. His "Loadmaster" design, developed on the "lifting body" principle, illustrates his contention that the load carrying body of an air transport should not only provide a minimum resistance to flight, but should also contribute to its own support. Burnelli has built nine versions of this evolution in modern airplane design . . . all of which have flown successfully.

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NEWS DIGEST

President Drops Hint Of Air Power Increase

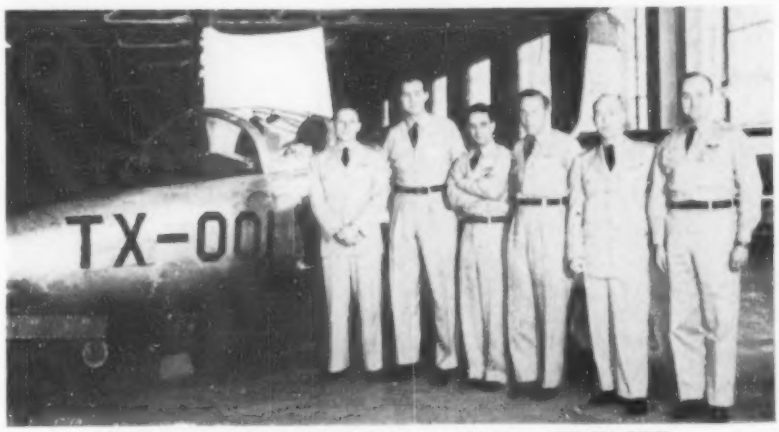
First hint that the Republican Administration may change its attitude on the air power defense budget was dropped by President Eisenhower last week in a speech at Boston. The President warned that no defense sacrifice, "no labor, no tax, no service" is too great for America to bear against enemies of freedom "equipped with the most terrible weapons of destruction."

This hint, coupled with word in Washington that the President is planning a nation-wide address soon on the defense situation in light of Russian atomic and hydrogen bomb progress, is being interpreted by Washington observers to mean an attempt to reserve the Republican trend of heavily slashing the military air power budget (AVIATION WEEK Sept. 7, p. 13). It also is expected to touch off a bitter intra-party battle between the advocates of the balanced-budget "at-any-cost" faction and those in the Administration who believe it must face squarely the reality of the growing Russian capability to deliver hydrogen and atomic bomb attacks directly on American population centers.

Meanwhile, indications from the Pentagon are that preliminary fiscal 1955 budget planning is being done on a basis of still further reductions in military air power. Preliminary Pentagon budget estimates for fiscal 1955 were due at the Budget Bureau Sept. 15, but at presstime late last week they had not yet appeared. Nor is there any indication of trends taken by the current reevaluation of the U. S. military requirements now under way in the Joint Chiefs of Staff.

Domestic

Donald C. McGraw is the new president of McGraw-Hill Publishing Co., succeeding his brother, the late Curtis W. McGraw. Prior to his election as president, Donald McGraw was vice president for manufacturing and general services. He has been a director since 1935 and vice president since 1945. A native of Madison, N. J., he is the youngest son of the late James H. McGraw, Sr., founder of the company. He attended Princeton University, served with the Navy in World War I. He was a consultant to the Publishing and Printing Division of the War Production Board during World War II.



INSPECTION BOARD SEES CESSNA TWIN-JET

USAF inspection board partially obscures the first picture released of the mockup of the Cessna T-37 twin-jet intermediate military trainer at Cessna's Wichita plant. The T-37 has a gross weight of 5,600 lb. and will cruise at 343 knots at 35,000 ft. altitude over the span of a 730-nautical-mile range.

Other officers of the McGraw-Hill Publishing Co. continue unchanged.

New airways plan adopted by Civil Aeronautics Administration would shift more airline traffic from L/MF airlines to new VHF omnirange (VOR) "Victor" networks by filling gaps in the partially completed VOR system with VHF aids such as ILS localizers, visual-aural ranges (VAR) and low-frequency radio beacons. Proposed by Air Transport Assn., the plan will extend Victor airways into terminal areas and make possible new VOR lanes.

Suspension or revocation of U. S. Airlines' cargo certificate is recommended by the Civil Aeronautics Board enforcement office. CAB attorneys charge the carrier suspended operation of its north-south routes, failed to report the action, and flew passenger instead of cargo aircraft.

Robert W. Cairns is new Deputy Assistant Secretary of Defense for Research and Development.

Aviation pioneers from countries affiliated with the Federation Aeronautique Internationale will be honored at a banquet in Washington's Mayflower Hotel Oct. 14, 48th anniversary of FAI. The dinner will be sponsored by the National Aeronautic Assn. as part of this year's celebration of half a century of powered flight.

Convair F-102 will begin flight tests soon at Edwards AFB, Calif. More than 300 employes of the corporation's San Diego Division will be assigned to the project.

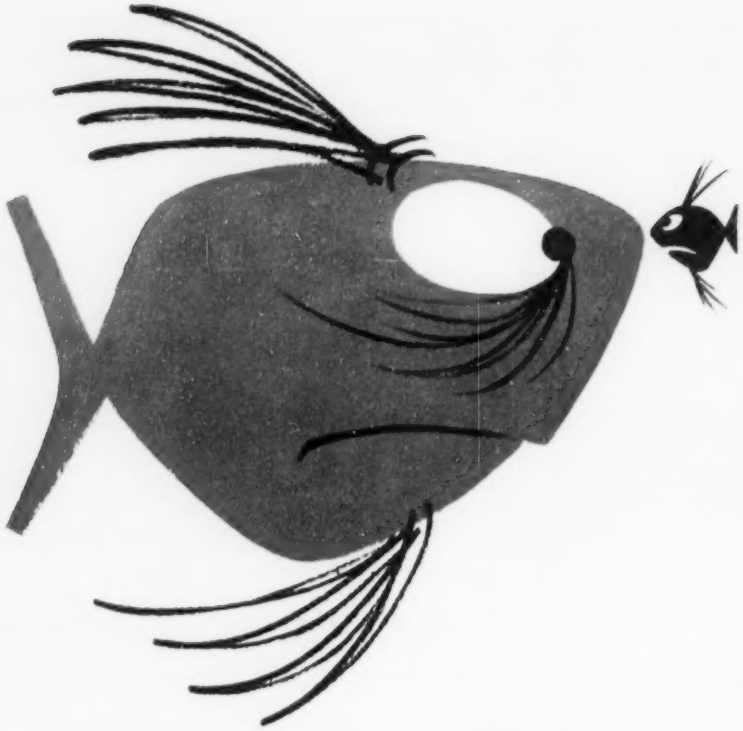
International

Neville Duke, RAF squadron leader and test pilot, raced a Hawker Hunter over a 100-kilometer (62-mi.) course at an average speed of 709.2 mph. Sept. 19 near Dunsford, England, bettering the record claim of 690.118 mph. set Sept. 1 by USAF Brig. Gen. J. S. Holtoner and the official mark of 652.55 mph. made May 18 by Jacqueline Cochran. Duke streaked a Hunter to a new three-kilometer record of 727.6 mph. Sept. 7 (AVIATION WEEK Sept. 14, p. 15). Both speed runs still must be confirmed by Federation Aeronautique Internationale.

British Overseas Airways Corp. reports a net deficit of $819,610 for the fiscal year ended Mar. 31, compared with a net profit of $770,000 for the previous 12-month period. Operating profit of $290,850 from revenues totaling $101,238,421 was wiped out after payment of interest on issued capital. Jet Comet operations cleared $95,000.

Australian National Airways has purchased two DC-6s and two spare engines from National Air Lines for approximately $2,750,000, also has ordered two of the transports from Douglas Aircraft Co.

Japan Air Lines has taken delivery on its first DC-6B, expects to receive two more by the end of next month to allow start of Tokyo-San Francisco flights by Dec. 1.



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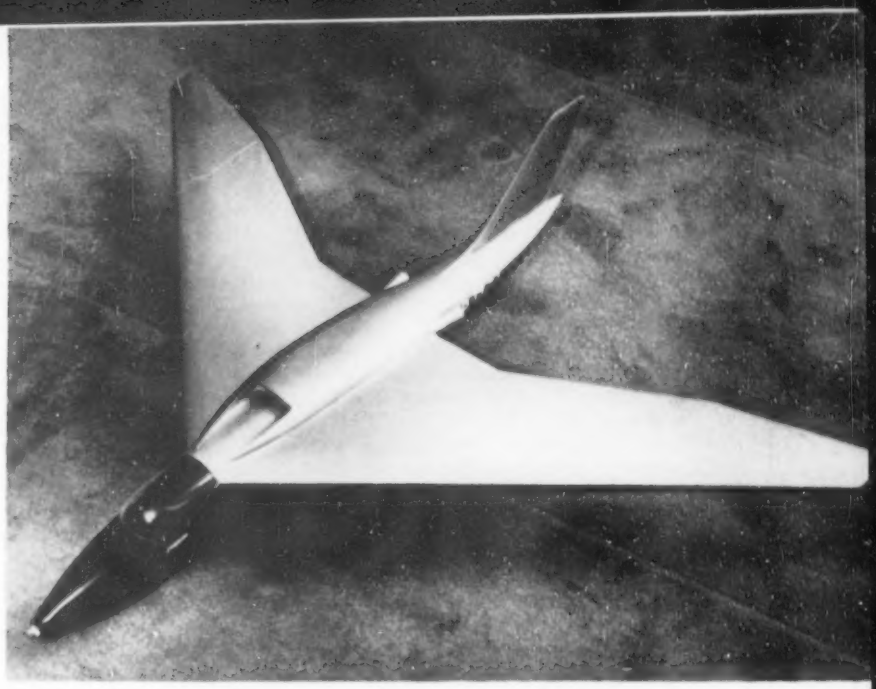
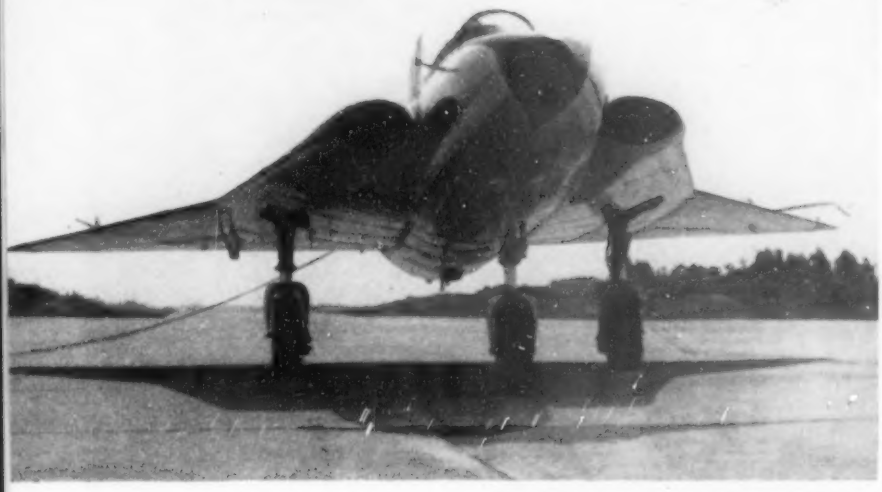
New Jet Aircraft In the Week's News



ALTITUDE PROBER—Model of new British experimental jet, Short Bros. & Harland's Sherpa (above), shows the altitude research craft's strange wing shape (Aviation Week Sept. 21, p. 14). Sherpa's aero-isoclinic wing is designed to deflect in bending, without twisting under aerodynamic load. Two Turbomeca engines power the plane.



DOUBLE DELTA—New view of Sweden's Saab-210 Draken delta research plane (left) shows change in air intake and nose design from model that made early flights. Intakes appear to have been moved rearward and separated from fuselage. The Draken, which now has made over 400 flights, made its public debut at recent Stockholm celebration of Sweden's flag day.

FIGHTING LEATHERNECK—U. S. Marines soon will be getting North American FJ-2 Fury (right), according to Navy announcement. The new Fury, an advanced version of Navy's FJ-1, has speed and performance comparable to the Air Force F-86 Sabre. FJ-2 in this photo carries large external tanks for added range. Note open dive brakes on fuselage sides.

INDUSTRY OBSERVER

► Russian air force has equipped its first combat group with new long-range turboprop bombers (AVIATION WEEK Aug. 31, p. 11). Known provisionally as the Type 31 or Tu-75, 18 of these planes have been assigned to three squadrons now stationed in northern Siberia, possibly on one of the new airfields in Kamchatka, 4,700 mi. across the Arctic Circle from New York.

► Russian sources have confirmed production of a new sweptwing version of the Il-28 twin-jet bomber series (Aviation Week Mar. 30, p. 30). Observers behind the Iron Curtain report the sweptwing Il-28s are flying in squadron service, indicating that production has been under way for some time. Sweepback of the new wings is estimated at 40 deg., with wings located farther forward on the fuselage than in the straightwing version. Some planes have been fitted with external fuel tanks.

► U.S. security officials are worried about another leak of vital jet engine information from British exploitation of commercial versions of the Rolls-Royce Avon series of axial-flow turbojets. The R.A.9, rated at 6,500 lb. thrust, already has been sold to foreign airlines in the Comet 2 jet transport and the civil version of the 10,000-lb.-thrust R.A.14 will be available to foreigners in the Comet 3. The R.A.14 currently is Britain's best military turbojet. U.S. officials feel strongly that the Russians do not yet have a good axial-flow turbojet and would be anxious to buy the secrets of Rolls' success. Engines now used in the MiG-15 were developed from centrifugal-flow Rolls-Royce Nene and Derwent turbojets sold to Russia in 1947 by the British.

► General Electric's nuclear aircraft engine project has been boosted to the status of a department under the firm's Atomic Products Division. D. R. Shoults, a pioneer in U.S. jet development, continues to head the project. The atomic engine was formerly under the jurisdiction of GE's Gas Turbine Division.

► Aerojet is building liquid-fueled integral takeoff assist units for USAF. B-47 now uses 18 solid propellant Rato units for takeoff boost.

► Curtiss-Wright soon will test a Bristol Olympus in a B-29 flying test bed to check engine controls developed for the J67, C-W's version of the engine which has design features of the split-compressor Olympus and is aimed at considerably higher thrust than current versions of the Bristol engine. The J67 is scheduled for advanced versions of the Convair F-102.

► Piasecki Helicopter Corp. has terminated its subcontract with Goodyear for building H-21 fuselages. Piasecki plans to build its own fuselages at its Morton, Pa., plant.

► Navy has given General Electric a contract to develop a new turboprop engine to deliver about 800 shp.

► British European Airways is considering a special airfreight version of the Vickers 801 Super-Viscount, BEA chairman Peter Masefield recently disclosed to a parliamentary committee. BEA has 12 Super-Viscounts on order with an option for another eight. Deliveries are expected in 1955-56.

► Current costs of new British jet transports recently were estimated by BEA and BOAC for a parliamentary committee as follows: Comet 1, $700,000; Comet 2, $1.4 million; Comet 3, $2.1 million; Britannia, $1.68 million; Viscount 701, $700,000; Viscount 801, $784,000. All prices include an initial provision of spares.

► De Havilland expects to crystallize final design of its Comet 3 jet transport in October after U.S. Civil Aeronautics Administration officials have had a chance for a final evaluation of the de Havilland proposals.

► USAF expects to lift the security wraps from the North American F-100 supersonic fighter and the Pratt & Whitney J57 10,000-lb.-thrust split-compressor turbojet at the Air Force flight test center next month.

WHO'S WHERE

In the Front Office

Ernest G. LeMay, Jr., has been appointed president and general manager of Century Controls Corp., Farmingdale, N. Y., specialists in design, development and prototype production of accessory control systems and accessories for aircraft. He formerly was with Wright Aeronautical and Stratos Division of Fairchild.

Erle M. Constable has been named assistant vice president-procurement of the Glenn L. Martin Co. He came to GLM from TWA where he was treasurer.

Henri G. Busignies, technical director of Federal Telecommunications Laboratories, Nutley, N. J., has been designated a vice president and member of the firm's management advisory board.

Mason Phelps, Jr., has been elected president of Pheoll Mfg. Co., Chicago, Ill., aircraft hardware firm.

Changes

Frank Martin has been appointed sales manager-commercial aircraft for Cessna Aircraft Co., Wichita; **Robert L. Lair** is now director of procurement and materiel.

Earl L. Washburn has been designated technical head of systems development section of Cook Research Laboratories Division, Cook Electric Co., Chicago, Ill. **Alton D. Anderson** has been named chief engineer of the research laboratories.

James B. Duke, formerly with Hamilton Standard, has joined Elastic Stop Nut Corp., of America, Union, N. J., as technical assistant to the general sales manager.

Russell H. Frary has been named director, service engineering for Avien, Woodside, N. Y., maker of aircraft electronic fuel gage systems.

William E. Corfield, for almost eight years aviation writer for the London Free Press, has been designated information officer of the Air Industries & Transport Assn. in Ottawa.

George J. Rindewald has been promoted to general sales manager by Edison Instrument Division, Thomas A. Edison, Inc., West Orange, N. J.

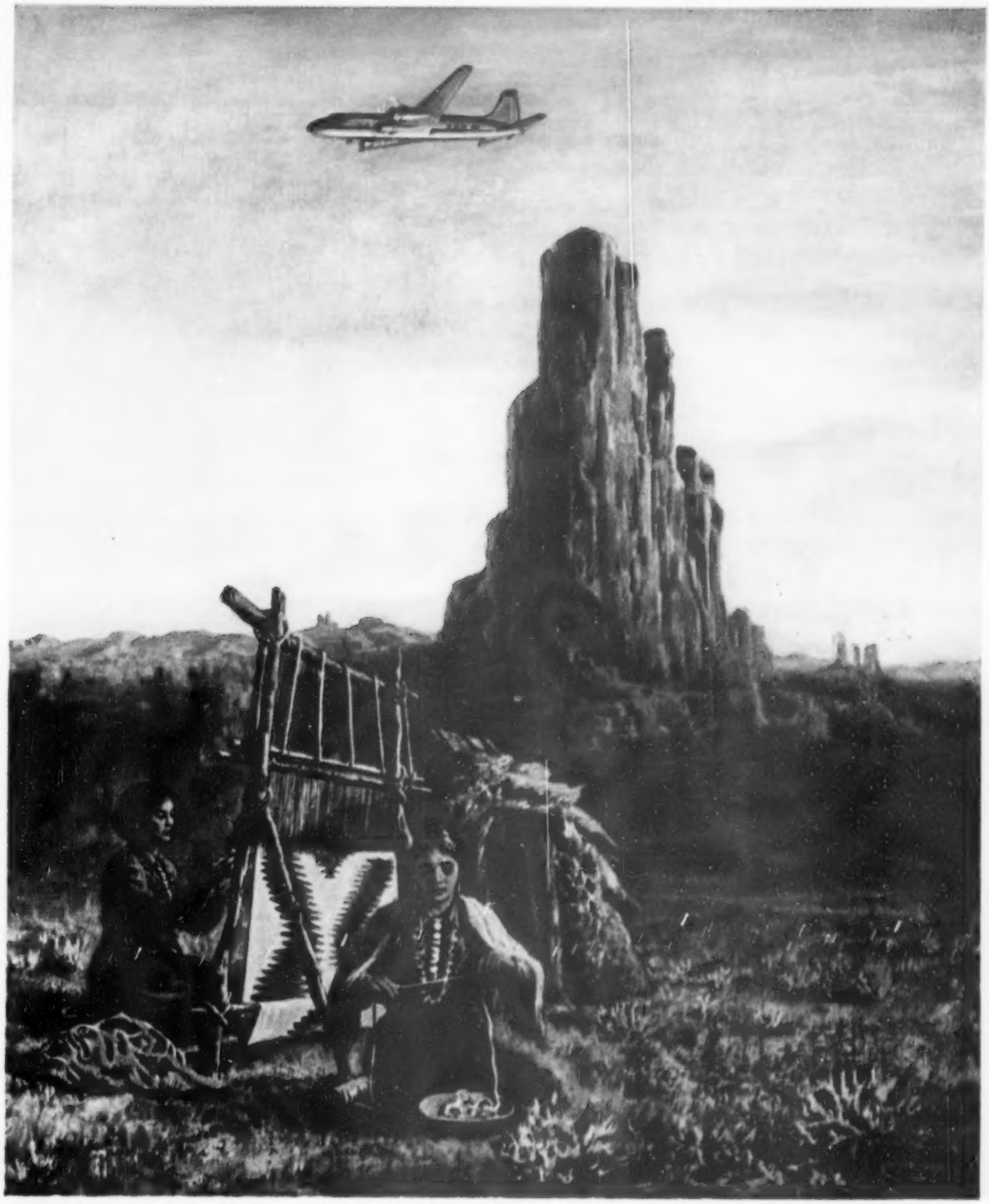
Raymond W. Fischer has been appointed operations manager for California Eastern Airways, Inc.

Ernie Beyl, former San Francisco newspaperman, has been named director of sales for Central Airlines, with headquarters at Meacham Field, Ft. Worth, Tex.

Honors and Elections

Dr. David G. C. Luck of RCA Laboratories is receiving the Stuart Ballantine Medal of the Franklin Institute of the State of Pennsylvania for his invention of the Omnidirectional radio range.

Harold Crary, retiring vice president of United Air Lines, was honored at a testimonial dinner by American Airlines in recognition of his nearly 30 years in the airline industry.



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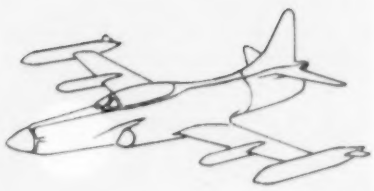

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AVIATION WEEK VOL. 59, NO. 13
SEPTEMBER 28, 1953

Fugitive MiG Heads for U.S. Test Center

- **AF races to wring out Russia's top combat jet.**
- **Delivery is first break in three-year search.**

By A. W. Jessup
(McGraw-Hill World News)

Tokyo—U. S. Air Force moved with lightning speed last week to capitalize on a big break before it could be stopped by diplomatic interference.

No sooner had a fugitive Communist MiG-15 stopped rolling at Kimpo Airfield than a well-greased USAF plan speeded the Russian jet fighter to testing centers in the United States.

Before any diplomatic fight over returning the aircraft ends, the Air Force hopes to compile all information it wants on the MiG-15.

▶ **MiG Wringout**—American pilots have wanted to fly the top Red combat fighter since MiGs entered the Korean war more than three years ago.

They believe the jet can exceed performance shown in Korea, because Communist pilots were under disciplinary wraps or lacked the know-how to wring everything out of the aircraft that is operationally the world's highest-altitude fighter.

▶ **Under Wraps**—USAF dropped a security blanket over the MiG immediately after it landed at Kimpo.

Officials were not willing to reveal any details regarding its design, equipment or whether the aircraft even has an engine, although it is obvious that the enemy knows the MiG-15's technical details.

▶ **Early Model**—The North Korean pilot who delivered the fighter to USAF says Russian instructors flew the best and latest MiGs, including those with radar equipment, while North Koreans and Chinese piloted poorer models.

Therefore, it is probable that the MiG that was sent to the United States is an early model.

▶ **Truce Violation**—The ex-Communist pilot reveals that Reds moved aircraft into Korea approximately 40 days ago, raising the question of whether the enemy has violated the truce.

Air Force is uncertain of how irrevocably the charge can be proved. U. S. authorities knew a year ago that Communist forces brought crated MiGs into North Korea.

Because the armistice agreement allows both sides to move aircraft back and forth provided the numerical level does not exceed the force in Korea when the truce was signed, there is an obvious technical detail that stymies any firm conviction.

But the charge puts a psychological burden on the Communists to prove they are not violating the agreement.

▶ **Red-Faced USAF**—The fugitive MiG swept through Korea to Kimpo unheralded. Red-faced Far East Air Forces officials attempted to claim USAF F-86s escorted the Communist jet from the border.

Their story was unmasked when the former Red flyer revealed that no Sabres escorted him to Kimpo.

▶ **Sonic Superiority**—Luckily, this pilot wanted to escape communism rather than win the Order of Suvorov, First Class. Otherwise, there would have been no gloating at United Nations air bases in Korea last week.

By indirection, he substantiated views of top airmen in this theater that sonic fighters are the best offensive air weapon in the world today.

▶ **Mystery Jet**—Arrival of the MiG-15 at Kimpo marked the end of a three-year effort by USAF to get a flyable sample of the sweptwing Russian jet fighter.

The first MiG-15s appeared in combat over North Korea in the late summer of 1950, operating from Manchurian bases.

Parts of an engine were recovered behind Communist lines from a crashed jet by a helicopter in the fall of 1950, and shortly thereafter a badly damaged but complete MiG-15 was fished up from the mud flats off the Korean coast by a copter.

USAF analysis of the MiG-15 was the basis of an exclusive article in AVIATION WEEK (July 7, 1952, p. 10).

Air Force was so anxious to get a flyable version of the fighter that it seriously considered having one built by an American aircraft manufacturer from drawings made from the damaged craft.

▶ **MiG Price Tag**—The $100,000 offer for the delivery of a MiG-15 to an Allied air base in Korea was made last spring by Gen. Mark Clark.

Two Polish pilots later crash landed MiG-15s on the Danish island of Bornholm in the Baltic in an effort to escape the Communists. Neither jet was flyable after the landings, although considerable technical data was obtained from them. But Clark's offer applied only to the Korean combat theater.

▶ **First Offer**—When the $100,000 payment—$50,000 for a MiG-15 and a $50,000 bonus for the first delivery—was publicized, Pentagon intelligence officers wryly recalled an offer made three years earlier to USAF in Europe by a Czech pilot who offered to deliver a MiG-15 intact for $10,000 and personal asylum.

The Czech was a former pilot in the Luftwaffe who had flown German jets. He was employed as a civilian worker at a Russian airfield in East Germany, where his duties required him to taxi MiG-15s from hangars to flight line and dispersal areas. The offer summarily was rejected by a top USAF general in Europe.

▶ **No Complications**—USAF said it

USAF to Take Wraps Off Soviet Jet

The first flyable Russian-built MiG-15 to fall into U. S. hands was scheduled to be unloaded at Wright-Patterson Air Force Base, Dayton, Ohio, late last week after a 7,600-mi. flight in a Douglas C-124 transport from Kimpo Air Base near Seoul, Korea.

Wings and tail of the Soviet jet fighter were removed from the fuselage for transport in the C-124.

Air Materiel Command sources told AVIATION WEEK *the MiG-15 would be reassembled at Wright-Patterson as soon as possible after arrival and made available for external observation and photographing by the press. It then will be evaluated by technical intelligence experts.*

USAF sources indicated that some of the top F-86 Sabre pilots of the Korean war would fly the MiG-15 to compare it with U. S. fighter types.

would pay the $100,000 to the North Korean who delivered the MiG-15 to Kimpo, because its original offer never had been withdrawn. The MiG pilot will be paid from a special fund of $31 million available to Secretary of the Air Force Harold E. Talbott.

The $50,000 for delivery of additional MiG-15s in Korea still stands.

No international complications are anticipated by USAF over the MiG incident, because the Korean war still is not over officially.

Hughes Flying Boat Crushed by Flood

Howard Hughes giant flying boat suffered damage estimated at more than $5 million when a large earth dike burst on nearby property, spilling thousands of tons of mud, silt and water into the Hughes hangar and drydock at Terminal Island, Calif.

The flood lifted the flying boat out of its dry dock and crushed it against an adjacent structure and the hangar.

A company spokesman says Hughes and his engineers believe it would require in excess of a year to repair the damage.

When the deluge occurred, the giant airplane—largest in the world—was undergoing final inspection preparatory to launching and the start of taxi and flight tests that were scheduled for early next month.

Damage to the ship included both wings, the hull, all eight nacelles, ailerons, tabs, horizontal stabilizer, rudder, rudder tab, and the hydraulic and mechanical control system.

An estimate of damage to facilities, machinery, electrical installations, files, records, blueprints and other equipment has not been made yet. It will require weeks to remove the residue deposited by the flood throughout the flying boat working area.

Temco Builds Trainer For Navy Contest

Temco Aircraft Corp. this week announced entry of a new primary basic military trainer—designed, manufactured and flown at the Dallas plant in 75 days—in Navy's design competition for a replacement for the SNJ.

Powered by a 225-hp. Continental engine, the new Model 33 Plebe is a two-place tandem, low-wing monoplane with tricycle landing gear and a power-operated free-blown bubble canopy.

Temco says the trainer will climb 1,350 fpm. carrying a gross weight of 2,500 lb. at sea level, has a top speed of 180 mph., cruises at 171 mph. Service ceiling at gross weight is 20,700 ft., range is 600 mi.

CANCELATION of jet engine orders was announced by Defense Secretary Charles Wilson (right) and Air Force Secretary Harold Talbott (left). Lt. Gen. Orval R. Cook, USAF Deputy Chief of Staff-Materiel (center), listens as Wilson elaborates on the cutbacks.

Engine Cuts Save AF Half Billion

Reductions result from longer life of turbojets and an oversupply of powerplants in Air Force stockpiles.

By Richard Balentine

Longer-lived turbojets coupled with the recent reshuffle of the entire military aircraft procurement program have forced the Air Force to reduce its future engine requirements.

A cutback of several thousand engines—some already contracted for, others only programmed—has been ordered. That will save the USAF from $400 to $500 million.

The move came as predicted (Aviation Week Aug. 31, p. 14) after weeks of study and review of the entire program. It followed a recent study of the aircraft program (Aviation Week Sept. 14, p. 18) which resulted in substantial aircraft cutbacks.

▶ **New Requirements**—Final details of the cutback have not crystallized. But Air Secretary Harold Talbott emphasizes that USAF's action in no way endangers the buildup to the present goal of 143 wings.

Chief reason for an engine cutback at this time, Talbott explained, is the fact that present jet engines are so much better than expected. Also the Air Force is accumulating a huge stockpile of spare piston and jet engines around the world, far more than will ever be needed.

"We've got an oversupply of jet engines," he said, "I saw them in Morocco, I saw them in France, and I saw them in every depot you go into. You see great stacks of these engines."

▶ **The Picture**—Two factors dominating the picture are these, he pointed out:

- "A much greater time between overhauls is now being realized from our jet engines. This greater time is a result of an accumulated know-how to operate jet engines, better manufacturing methods, improved design of our engines, and increased maintenance capability.
- "We have decreased our attrition rates. This reduction is due partially to the decrease in the flying-hours program which, is the index of our peacetime training. Our accident rate has been gradually decreasing and we consequently have requirements for fewer engines.

"There was no mistake in the original jet engine order," he said. "We had no experience factors on which to base either time between overhaul or life expectancy of our engines. Actual use, especially the accelerating factors resulting from the Korean hostilities, has now given us valid figures on which to base requirements."

▶ **GE Hard Hit**—Hardest hit by the cutback is General Electric. The largest number of engines canceled were GE's J47s which power the B-47 Stratojet and F-86F Sabre. Exactly how many will be involved is not known yet. USAF earlier had canceled orders for several

thousand J47s at GE, Studebaker and Packard.

Practically every reciprocating and jet engine USAF now is buying will be affected in the reshuffle, except the Pratt & Whitney J57, production of which will be increased at P&WA's East Hartford, Conn., plant.

Ford Motor Co. is tooling to produce the J57 at its Chicago plant where it now is building the P&WA R4360.

In lining up the engine program to match the recently reshuffled aircraft program, Air Force will have to cut the Curtiss-Wright J65 Sapphire engine which powers the Republic F-84F. More than 500 of these sweptwing fighters and the North American F-86Fs recently were cut to enable Air Force to increase orders for NAA F-100, McDonnell F-101 and the Republic F-105.

Each of those fighters, except the F-105, will be powered by the Pratt & Whitney J57. The F-105 gets the Allison J71.

▶ **B-47 Cutback**—At the same time USAF cut 579 fighters, it canceled 151 B-47s from its current program. This cutback, coupled with the increased life expectancy of the J47, has reduced USAF's requirement for the engine considerably. Some J47s are now going 1,000 hr. between overhaul when they were estimated originally at 100 hr. Two GE plants affected will be Lockland in Cincinnati and the West Lynn, Mass. plant.

▶ **Second Sources**—Aside from prime sources affected such as General Electric, Air Force will phase out its contracts in secondary sources such as:

- **Studebaker**, building the J47 at South Bend, Ind.
- **Nash**, building P&WA R2800 at Kenosha, Wis.
- **Packard**, building the J47 at Detroit, Mich.
- **Buick**, building the J65 at Flint, Mich.
- **Chevrolet**, building the Wright R3350 at Tonowanda, N. Y.

Talbott said these licensee firms may complete production of their engine orders sooner than was planned originally. They all are expected to be out of engine orders by next spring. Ford is the only licensee not affected, since it is tooling for production of the J57.

▶ **Other Cuts**—Talbott said the J57 is "the engine we are relying on." He called it Air Force's future engine.

The Allison J33, which powers the Lockheed F-94, F-80 and T-33, will also be affected by the cutback. Of the latter, 141 basic trainers were cut by USAF earlier when it reshuffled its aircraft production program. Reciprocating Wright R3350s and P&WA R2800s also are hit.

Defense Secretary Charles Wilson explains the engine cutback as being "just like ordering a pound of beefsteak and finding you only want a half pound. That is all you can eat. So, not knowing how hungry we might be for these spare engines, we ordered more engines than we could eat on our maintenance and service program. We don't eat them up so fast."

Talbott praised engine manufacturers generally for the "remarkable strides that have been made in the development of jet engines in the last two and three years. The manufacturers have done a magnificent job and the engines have gotten better and better."

▶ **Wilson Comment**—Wilson quoted former President Truman in answer to the question, What will the opposition say about the current cutback?

"I understand he once said that if you can't stand the heat, you'd better stay out of the kitchen and let somebody else do the cooking."

Talbott's comment: "By the time you do anything, if it happens to save money, they yell bloody murder. These figures have been prepared by the Air Force staff, not instituted by me or the Department of Defense, and this is what the Air Force thinks they require. In this changed program we still have not affected one plane or the production of one plane; and after all, your engine is a part of the plane."

Along with the cutback, USAF revealed it now is placing increasing emphasis on development and production of turboprop engines. So far the turboprop is only in development stage. USAF is counting on the Navy-sponsored P&WA T34 and the Allison T40. Talbott predicted they might be in production by next spring.

▶ **Constant Revision**—Navy recently cut back production of the Douglas A2D (AVIATION WEEK Sept. 21, p. 7) because of development problems with the T40.

The procurement picture will be under constant revision, Talbott pointed out, so that further cutbacks in aircraft and engines could be possible or there could be some stepup on some items under the review system.

"We don't want to buy the wrong kind of planes," Secretary Wilson said. "We don't want to buy a plane that the Air Force has already made up their minds is obsolescent, that their engineers and people know how to make a better one, and if we don't need it in the meantime, we want to save our money and put it down on the more advanced model even though we bought some more planes and shuffled those over into the secondary category or in some kind of a training reserve, or something, so that the whole objective is to spend the money intelligently, to build the most powerful Air Force in the world and to have it as quick as you can here now."

Hughes Blowup

- **Six top officials quit in protest of owner policies.**
- **Talbott intervenes but fails to halt walkout.**

At least six top officials of Hughes Aircraft Co., one of the nation's largest avionics producers and a major contributor to the country's air defense program, have quit the company in protest against the policies of Howard Hughes, multi-millionaire owner of the company, AVIATION WEEK has learned. Other resignations may follow—some second-tier officials have indicated they will resign.

The officials, four of them vice presidents, include: Gen. Harold L. George, general manager; C. B. Thornton, asst. general manager; Dr. Simon Ramo, chief of operations; Dr. Dean Wooldridge, head of the Hughes Laboratories; Dr. R. P. Johnson, asst. head of the labs; and R. B. Parkhurst, manager of manufacturing.

▶ **Situation Grave**—Gravity of the situation to USAF is evidenced by hurried visit made by Secretary of the Air Force Harold Talbott to Los Angeles in an attempt to forestall the resignations of the men who, in five years, had helped build the company from a small experimental aircraft outfit to a $200-million-a-year avionics producer (AVIATION WEEK May 25, p. 14, June 29, p. 44). Accompanying Talbott to Los Angeles were Undersecretary Roger Lewis and Lt. Gen. Orval Cook, USAF Deputy Chief of Staff-Materiel.

An official said: "The defense projects were being affected by the organizational trouble."

Hughes produces fire control systems for all of the USAF's current interceptors, one of the Navy's and the Canadian CF-100; is developing advanced systems for newer interceptors like the Convair F-102. The company also developed the Falcon air-to-air guided missile (F-98), which is believed to be in production.

▶ **First Indication**—First public indication of the break between Hughes and HAC management came with the announcement on Sept. 17 that Drs. Ramo and Wooldridge had quit Hughes to head a new avionic company, the Ramo-Wooldridge Corp., organized by Thompson Products, Inc. of Cleveland. A few days later, Hughes Aircraft announced the resignation of Gen. George.

Ramo and Wooldridge were the two top scientists at HAC and had been with the company since 1946 when it first entered the avionics and guided

XH-17 Canceled

The huge turbojet-powered Hughes Aircraft XH-17 helicopter, and its larger successor, the XH-28, have been canceled in the Air Force procurement reshuffle.

Nicholas Stefano, formerly chief of the Hughes Helicopter Division, has joined American Helicopter Co.

missiles fields. Both are men of considerable stature in the industry and were instrumental in attracting some of the top scientists now at Hughes.

(Thompson Products, which first entered the electronics field in 1950, holds a stock interest in the newly formed corporation. Wooldridge is president and Ramo is vice president and executive director.)

▶ **Long Brewing**—The situation which led to the break is believed to have been brewing for some time and is not directly related to Hughes' earlier attempts to sell the company. Resignations reportedly have been in Hughes' hands for at least several weeks. Each was submitted individually, AVIATION WEEK was told, with no attempt at collective action.

Six weeks ago, Noah Dietrich, executive vice president of Hughes Tool Co., took over control of Hughes Aircraft, apparently by-passing Gen. Ira Eaker, who has been chief liaison officer between the two companies.

On Sept. 21, Hughes reportedly met with company officials in a last-ditch session which lasted from 9:30 p.m. to 2:30 a.m. but to no avail.

Uncertainties over Hughes' plans for the company's future are believed to have rankled HAC management. During conversations with AVIATION WEEK this spring, when rumors of the company's impending sale were rampant, top HAC management confidentially admitted that all that they knew about the move was "what they read in the press." AVIATION WEEK also was told that funds allocated for management bonuses were not distributed.

▶ **Company Future**—Despite their own actions, departing officials are reportedly urging lower-echelon people to remain with the company to continue important air defense projects. A resigning officials explains this by saying that they feel considerable pride in the organization which they built up and are reluctant to see their efforts dissipated.

C-124s on Pacific Airlift

Air Force is operating six C-124s on regularly scheduled trans-Pacific airlift flights, plans to add more Globemasters to the Far East route in the future.

Hurley's Views on New Transports

Don't Sell Piston Power Short

Another round of reciprocating engine airliners will precede turboprop era in U. S., C-W president predicts.

The U. S. airline industry will buy another round of piston-powered transports before entering the gas turbine era by switching to turboprops, Roy Hurley, president and chairman of the Curtiss-Wright Corp. predicted to AVIATION WEEK last week.

Hurley said additional improvements in the compound piston engine and refinements in current airframe designs would enable airlines to operate a nonstop transcontinental schedule in seven hours with piston-powered equipment. American Airlines recently announced the beginning of an eight-hour nonstop transcontinental schedule with Douglas DC-7s powered by Wright R3350 Turbo Compound piston engines.

▶ **Greater Economy**—Airlines eventually will make the switch to gas turbine power with the turboprop rather than the turbojet because of the greater operating economy afforded by the turbine-driven propeller, according to Hurley. He said the propeller faced a useful future in both the transonic and supersonic speed ranges.

Later, in a speech before the Advertising Club of Washington, Hurley said the major problem facing aviation today is the growing disparity between the increasing complexity of modern aircraft and the capacity of the aircraft industry to produce them fast enough, in sufficient quantities and at a reasonable cost.

▶ **Wrong Philosophy**—Hurley blamed current military procurement laws for shackling the aircraft industry to a slow rate of growth except in time of emergency.

He said that these laws were motivated by a fear that the aircraft industry's return on net worth would get too high and warned that unless this philosophy is scrapped Congress and the military will have to accept a low rate of return on net worth in lieu of the completed, combat-ready aircraft which they originally had wanted from the industry.

The aircraft industry should be encouraged to plow back money into development of increased and more efficient production capacity by allowing accelerated amortization costs.

Hurley stressed that this policy would permit the aircraft firms to invest 100 cents of every dollar so expended in better productive capacity instead of the 2 cents on every dollar now available from net income after taxes and dividend requirements.

▶ **Progress Slow**—Hurley said the aircraft industry had been considering pushing an accelerated amortization policy for three years but there had been no real progress yet.

"The answer to aircraft industry problems doesn't lie in making more money through higher prices but in reducing costs by more efficient production," Hurley said. "The industry should be encouraged to plow money back into increased productive capacity and the government can easily take it away if companies fail to use the money for that purpose.

"I don't think the answer lies in a guaranteed annual production rate over a long period of time, either. The aircraft industry has to take its chances on delivering the right product at the right price and the right time just as any other industry does."

▶ **Space and Tools**—Hurley said that with a policy of accelerated amortization costs in effect, Curtiss-Wright could have provided the plant expansion required by the Korean emergency for a $5-million investment annually for the first five years after World War II ended and a $2.5-million investment annually in subsequent years.

The goal of the aircraft industry's productive capacity expansion should be aimed at providing the plant space and tools to meet current military requirements with a single shift 40-hour work

DC-7 Order

Pan American-Grace Airways last week announced purchase of five Douglas DC-7s for delivery in mid-1955.

This brings Douglas orders for the DC-7 to 69 planes. The others: American 25, United 25, Delta 10 and National 4.

Panagra says the DC-7s will lop more than two hours from New York-Buenos Aires DC-6 time. They will bridge the gap until availability of suitable long-range turbine-powered planes, Panagra added.

The DC-7 is the fastest piston-powered transport in the world, cruising at speeds up to 365 mph. It is powered with the Wright R3350 Turbo Compound engine.

week, he said, and with this base in-being any future emergency could be met much faster by simply shifting to a three-shift 48-hour operation without any requirement for additional plant space or tools–the two worst bottlenecks in the Korean war emergency expansion.

"If I were an enemy of the United States I would keep up my own aircraft productive capacity and watch carefully the increasing separation between the complexity of our aircraft and our ability to produce them with sufficient speed in sufficient quantities. When an enemy can strike with sufficient force to inflict damage on our inadequate productive capacity that can't easily be recovered then he will be tempted to attack and, unfortunately for us, he would enjoy a good chance for success."

NAL Official Denies Comet Negotiations

Robert E. Wieland, National Airlines executive, last week said his company is interested in Comets but described as "exaggerated" reports from London that he negotiated with de Havilland Aircraft Co. for 12 jet transports.

"We're interested, the same as any other airline," NAL's regional vice president-New York told AVIATION WEEK. "But there are no negotiations.

"I looked at the Comet while I was in London and discussed it with de Havilland–exploratory talks, certainly no deal.

"If we ever do start negotiations, we'll be the first to admit it."

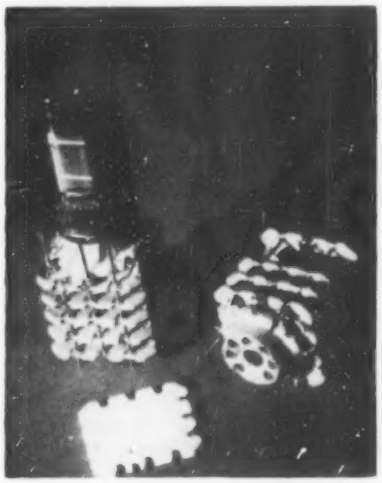
▶ **DH Surprised**–Dispatches from London early last week reported that Wieland said National would pay more than $25 million for 12 jet transports, probably Comet 2s and 3s. The reports quoted him as saying: "We think that although the Mark 1 Comet would not be economical for us, we would certainly like Mark 2s and 3s. There have been some excuses by Americans about the question of delivery dates, but all I can say is that it seems the dates would suit us."

But de Havilland spokesmen told AVIATION WEEK's London correspondent that any decision by NAL to buy the turbine-powered liner came as a surprise to them.

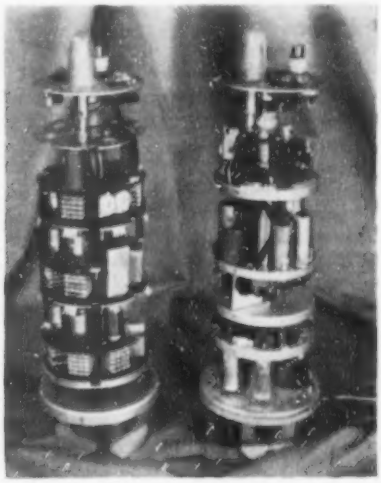
▶ **U. S. Jet Wanted**–A few days before the report of negotiations, G. T. Baker, president and board chairman of National indicated the airline intends to wait for a jet transport produced in the United States.

"When America's airlines are ready for jets," Baker said Sept. 15 in New York, "the superior production methods of our manufacturers will enable us to catch the British in a hurry."

AUTOMATIC FACTORY for producing electronics, developed by Bureau of Standards for Navy BuAer, could revolutionize industry. Present pilot plant is designed to make . . .



TINY MODULES, machine assembled and wired, at a rate of 1,000 per hour.



COMPARISON of new module construction (left) with older technique (right).

Navy Unveils Automatic Factory

The Navy Bureau of Aeronautics and the National Bureau of Standards have taken the wraps off Project Tinkertoy, the nation's first "automatic factory" for mechanized production of electronics and its radically new fabrication techniques which could revolutionize electronics manufacturing.

During the past two weeks, top-level representatives from approximately 100 electronics and aircraft companies got their first look at the new process in a pilot plant which has been operating for several months in an obscure building near the Pentagon. Industry was impressed that Navy/NBS had progressed so far so fast. Existence of the program and the pilot plant had been a well-kept secret.

Developed by NBS, with the aid of several industrial contractors, Project Tinkertoy is viewed by the Navy as the answer to the problem of how to produce the vast quantities of electronic equipment which would be required in the event of war. The process is best adapted to large-scale production programs.

▶ **Eye-Opener**–Visitors at the pilot plant saw raw materials going in one end of the production line and finished electronic modules, consisting of a tube and associated resistors and capacitors, rolling off the other end. Instead of the

familiar sight of row-upon-row of women wielding soldering irons, visitors saw 21 intricate machines, each attended by a single supervisor.

At appropriate stations, each module component is automatically tested and sorted according to tolerances established by punch-cards. Rejects are discarded automatically.

▶ **Not Fully Automatic Yet**—The present operation is not completely automatic. For instance, sub-assemblies are hand-carried from one machine to the next. However, an NBS spokesman says the objective was to mechanize only the critical manufacturing operations. The mechanized handling techniques used within individual machines should be easy to apply to the task of transporting sub-assemblies between machines.

The pilot plant is presently being operated for the Navy by Kaiser Electronics Division of Willys Motors, Inc. to shake out minor bugs and establish module manufacturing costs. Present goal is to be able to produce individual modules at a cost of 50 cents. Plant output is going into a submarine detection device (adapted by Sanders Associates, Inc.) which will serve as a proving ground.

▶ **Tinkertoy Advantages**—Navy has put almost $5 million into the development of its present pilot plant, although a spokesman estimates the present plant now could be duplicated by industry for around a million dollars. If Project Tinkertoy techniques spread through the industry, Navy expects its investment to pay off in the following ways:

• **Lower cost.** Navy and NBS estimate a Tinkertoy plant could cut electronic equipment manufacturing cost 20-25%.

• **Quick expansion.** In an emergency, plant output can be quickly expanded by going on a 24-hour day, 7-day week, without necessity of hiring and training large numbers of new workers. (Goal of present plant is 1,000 modules per hour.)

• **Fast conversion.** An automatic factory producing modules for TV sets could be converted within 24 hours to produce modules for military gear, Navy estimates.

• **Uniform quality.** Elimination of manual operations and use of 100% inspection during manufacturing cycle should produce more uniform, higher quality product, Navy says.

• **Reduced lead time.** Because Tinkertoy plant operates largely from raw materials, present lead-time cycle between component and equipment manufacturers should be eliminated, Navy says.

▶ **Modular Construction**—The Tinkertoy plant operation is based on turning out small modular units, $\frac{7}{8}$ in. square by approximately one inch long. These can contain resistors, capacitors, reactors, diodes and a miniature or subminiature tube base, all suitable interconnected to form the equivalent of one or two electronic stages. Each module may contain up to 20 resistors or capacitors, or combination thereof.

Groups of Tinkertoy modules are then combined on a chassis (module placement may be either manual or automatic) to form a variety of military or commercial electronic equipments. Individual module circuitry is tailored to the requirements of the particular equipment.

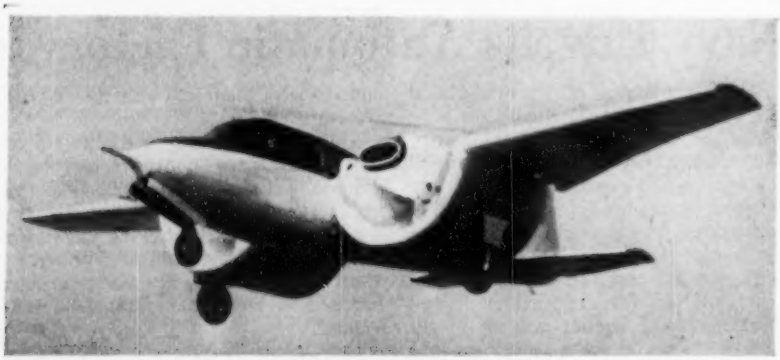
▶ **Ceramic Wafers**—Each of the modules consists of four to six machine-made ceramic wafers. During the manufacturing cycle, the wafers are silver-painted with the necessary conducting surfaces. To these are attached resistors consisting of machine-made carbon-coated tape, or capacitors consisting of small ceramic squares which have been machine-coated with silver. Tube sockets are automatically formed and secured to other ceramic wafers.

Where inductors or diodes are required, conventional components can be used and machine-mounted on a ceramic wafer. All wafers required for a single module are assembled by a machine which solders a wire lattice-work along the four edges of the wafers. The lattice work serves both as a mechanical support and an electrical interconnection between individual wafers.

▶ **Significant Difference**—Under contract to the Army Signal Corps, General Electric has been developing automatic-factory-type machines for producing electronics (AVIATION WEEK Nov. 17, 1952, p. 36). Prototype machines are slated for delivery soon. Air Force has a similar program under way at Stanford Research Institute. Significant difference between these programs and the Navy's is that the former are designed to use conventional resistors, capacitors, and other components rather than fabricating them during the manufacturing process.

That will be an important difference to component manufacturers if the Project Tinkertoy process spreads through the industry. Component suppliers who attended the Navy demonstration reportedly voiced concern over their position. It seems certain some component manufacturers will consider the possibility of producing Tinkertoy modules themselves and supplying them to equipment manufactuers.

▶ **Industry Enthusiasm**—The Navy plans to make available all its Project Tinkertoy know-how and drawings to qualified industries, and several already have made inquiries, a Navy spokesman told AVIATION WEEK. The Navy also is setting up additional demonstrations at industry request and plans to show a Project Tinkertoy display and movie of the manufacturing process at the National Electronics Conference in Chicago, Sept. 28-30.—**PK.**



CHANNEL-WING BRIGADIER FLIES

Baumann Brigadier equipped with Custer channel wings takes to the air during its recently inaugurated flight test program. Designated the CCW-5, the light transport craft has been entered in the England-New Zealand air race Oct. 10.

Demand for Jet Fuel Nears Avgas Market

Demand for jet aircraft fuel will surpass the market for aviation gasoline by the end of 1954, James H. Doolittle, vice president of the Shell Oil Co., told the 51st annual meeting of the National Petroleum Assn. in Atlantic City.

Doolittle said the military demand for aviation gasoline would continue to increase slightly during the next several years but will be overtaken by the rapidly rising requirement for jet fuel before the end of next year. The market for commercial aviation gasoline will continue to expand gradually until turboprops and turbojets come into airline use, Doolittle said.

▶ **Airlift Needs**—He emphasized that any national emergency similar to the Korean war in the immediate future would result in an increased aviation gasoline requirement, since much of the military flying involved, particularly long-range airlift, would be done on piston engines.

Jet engines already are approaching

the critical point for operations on natural lubricants, and the future trend will see heavier demands for synthetic lubricants that can meet the requirements of high-altitude jet operations.

"These demand estimates are based on today's generally backward thinking," Doolittle said. "If there is soon to be a more realistic appreciation of our military air requirements and our commercial aviation potential then the 'road blocks' will be removed and the demand for all petroleum products will be greatly increased."

Security Scuttles Jet Pod Debate

Avro's answer to Boeing arguments on engine mounts is withheld from Anglo-American air conference.

By David A. Anderton

London—The British contingent to the joint Anglo-American Aeronautical Conference came loaded for bear in its rebuttal to U.S. arguments for pod-mounted jet engine installations. But a security officer got buck fever, and the hunters fired late or wide of the mark.

George Schairer, chief of Boeing Airplane Co.'s technical staff, again championed the podded turbojet in a paper delivered during the first afternoon of the conference.

▶ **Off-and-on Security**—Strongest rejoinder to Schairer was expected from S. D. Davies, chief designer for A. V. Roe and Co., scheduled to present a paper on delta-wing aircraft—understood by most delegates to include a defense of the British approach of buried engines. But at the last minute, the paper was withdrawn for security reasons.

Commented Sir William Farren, president of the Royal Aeronautical Society: "Owing to the difficulties . . . about security, it was decided that it is unwise that you should know that such a thing (Avro's delta-wing Vulcan) exists. How this is consistent with what happened at Farnborough last week I do not know, but that is one of the things those who rule our lives would explain if only we knew who they are."

▶ **Mechanic's Feet**—Schairer's presentation generally was similar to those he has delivered in the U.S. (Aviation Week May 18, p. 29), but the paper contained one departure. During the illustration of his points on maintenance of podded engines, an unmistakable picture of the Comet engine intakes was inadvertently shown on the screen.

"How did that get in here?" Schairer said. But by then, the point had been made. Out of the buried inlet were sticking a pair of mechanic's feet.

▶ **Thick Wings**—George Edwards, director and chief engineer for Vickers Armstrongs, led off replies to Schairer by stating that the British approach resulted from bomber requirements.

Design studies showed a low wing-loading would be necessary, which meant a large wing and therefore one that could be geometrically thick enough to contain the engines.

"As long as we keep coming out with wings that big," Edwards said, "we think it better to bury the engines in them."

▶ **Better Performance**—G. H. Lee, deputy chief designer for Handley Page, Ltd., makers of the be-flapped Victor, presented a quick comparison of podded and buried engine installations that scored almost equal drag for similar airplanes but allowed the buried type of installation to have 50% more wing area.

"With two-thirds the wing-loading, we can get better performance at height, and better landing conditions," Lee said.

▶ **Pods for XB-58**—Pods were defended by W. A. Clegern, Convair-Ft. Worth chief of engineering flight test. He pointed out that Convair's new supersonic delta-wing bomber, still on the drawing boards, would have podded engines.

In answer to British claims that a thick wing paid a dividend in allowing the landing gear to be retracted inside, Clegern said the XB-58 would have both a thin wing and wing-housed landing gear.

▶ **British Safety**—Commenting on the safety aspects of pods, several of the British speakers expressed surprise at the need to worry about "explosive" engine failures, where a compressor or turbine wheel disintegrates.

"We don't have engine failures," said Avro's S. D. Davies.

"We don't use austenitic steels in turbine wheels as the Americans do," said A. A. Lombard, chief designer of Rolls-Royce Ltd.'s Aero Division. "They get spongy at high temperatures. We use chrome steels, and we don't have failures."

Added Air Commodore F. R. Banks, who presided at the meeting: "Turbine wheels just don't have to let go, any more than cabins have to fail at 40,000 feet."

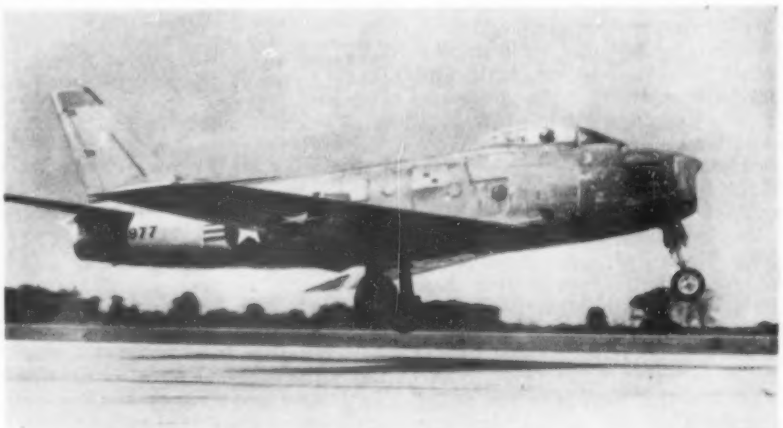
▶ **Winning Argument**—After the meeting, both sides still disagreed. But on one point there was agreement: The real argument is not pods against buried engines, but American design philosophy against British.

One Briton had the answer to that one, too.

"If we had to retaliate tomorrow, it would be your B-47s that would have to do the job," he said. "That would make all of us in favor of pods."

More than 700 delegates from the United States, Great Britain and other countries attended the three-day conference, sponsored jointly by the RAeS and the Institute of the Aeronautical Sciences.

Of the 12 papers presented during the technical sessions, six were by Americans, four by Britons and two by Canadians. A complete summary report of the conference will appear in Aviation Week.



F-86H FLIES AT COLUMBUS

First North American F-86H Sabre to come off the company's Columbus, Ohio, production lines is shown taking off on a test flight. The new F-86H dual-purpose fighter-bomber is slightly larger than previous Sabre day fighters and is powered by the new General Electric J73, which develops more thrust than the J47 in other F-86s.

Post Office Starts Airmail Experiment

Tons of first-class U. S. mail leave the rails and take to the air late this week or early next, starting a revolutionary experiment by Post Office and the airlines.

Airmail service for 3-cent-stamp letters and news journals may be expanded within a year to cover more routes, Postmaster General Arthur Summerfield says. Initial routes are New York-Chicago and Washington-Chicago.

The airlines certificated to haul airmail on these routes are American, Capital, TWA and United. All agreed to the rates, but some did so grudgingly. Rates are 18-20 cents a ton-mile, compared with 45-53 cents for straight 6-cent airmail.

Civil Aeronautics Board last week gave final approval to these low rates proposed in ultimatum form just two weeks previous by Summerfield (AVIATION WEEK Sept. 21, p. 89).

▶ **Other Carriers**—Summerfield said he was "naturally gratified" by the Board's record-speed acquiescence to the controversial rates. But he added a stinger statement, apparently urging CAB to let down the bars to cargo and possibly nonsked airlines for participation in the mail airlift.

He said: "We understand that other carriers have applications to carry first-class and other preferential mail by air, and we are making inquiries as to their possible addition to the list of those already authorized to do so."

Flying Tiger Line and Slick Airways have petitioned CAB for permission to fly the mail at airfreight rates. They claim that first-class mail service is an airfreight class of service and that airfreight certificates therefore include transportation of this type of mail.

▶ **Sked Answers**—American Airlines lashed back, stating that the Tiger-Slick motion to CAB was incorrectly filed and, furthermore, that "in any event, no such exemption (for them to carry mail) should be granted . . . without amendments of their respective certificates granted after notice and hearing."

American adds: "Even if Slick and Flying Tigers had shown some public need for the service they propose, there would be no justification for circumventing the certificate provisions of the Civil Aeronautics Act as they seek to do."

To show that there is no compelling need for additional carriers, American cites statistics. The company says: "Average daily unused capacity in the cargo compartments of the aircraft operated by American and United alone in nonstop flights New York-Chicago amounts to over 100 tons a day."

This is "more than three times the volume of New York-Newark-Chicago first-class and other preferential mail estimated in the Postmaster General's petition." And this does not include other AA and UAL New York-Chicago flights that make one or more stops en route, American says.

BOAC's Comet Makes Record Flight

(McGraw-Hill World News)

London—First production Comet 2 to roll out of de Havilland Aircraft Co.'s plant made a record run last week to and from Rio de Janeiro during a route test of British Overseas Airways Corp.'s new jet transport service to South America.

De Havilland plans to produce approximately 45 of the new Comet versions, has announced orders for 31.

As the first Comet 2 made its record flights, fuselages for eight additional Mark 2s were on the DH production floor at Hatfield Aerodrome. Two more are under construction at the company's Chester plant, and two are being built by Short Bros. & Harland at Belfast, Northern Ireland.

To pave the way for Comet 3s, de Havilland plans to wind up deliveries of Mark 2s earlier in 1956. But production can be stepped up beyond 45 planes to meet additional orders.

Meanwhile, sticking out of the DH experimental shop at Hatfield is the rear section of the prototype Comet 3.

Company officials say the airliner will make its maiden flight next June.

Hiller Gets License For Doman Copter

Doman Helicopters, Danbury, Conn., has licensed production of its H-31 to Hiller Helicopters' Palo Alto, Calif., plant to meet increased military demand for the three-place, Lycoming-powered Army ambulance.

Company spokemen report the agreement will exist for the H-31's military life, provides a "favorable royalty rate" to Doman on sales by Hiller.

Civil Aircraft, Engine Shipments

	July 1953	June 1953	1952 July
Complete aircraft	402	339	353
By weight of airframe:			
Less than 3,000 lb.	378	316	328
3,000 lb. and heavier	24	23	25
By number of places:			
One-to-five-place	378	316	328
More than five places	24	23	25
By total rated hp., all engines:			
Up to 399 hp.	378	316	328
400 hp. and more	24	23	25
Total value of shipments of complete aircraft and parts (000 omitted)	$31,637	$28,711	$22,645
Aircraft	23,117	20,985	15,611
Less than 3,000 airframe lb.	3,514	2,680	2,239
3,000 lb. and heavier	19,603	18,305	13,372
Aircraft parts	8,520	7,726	7,034
Total value of shipments of aircraft engines and parts (000 omitted)	$12,749	$13,060	$10,553
Aircraft engines	6,583	6,636	2,917
Engine parts	6,166	6,424	7,641
Unfilled orders (3,000 lb. and heavier)	353	377	573

Civil Aircraft Shipments Increase

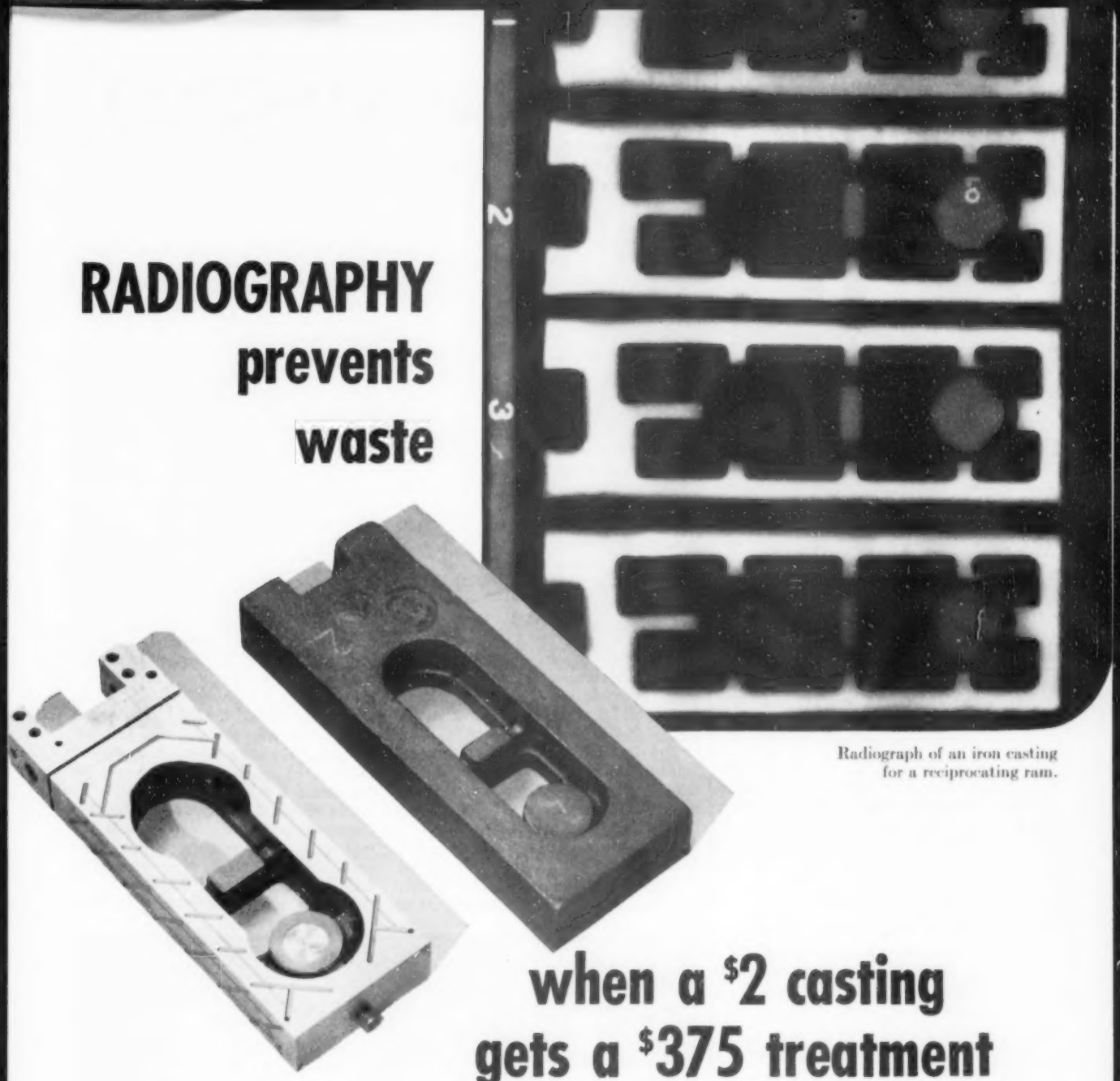
Aircraft industry shipped 402 civil planes valued at $23.1 million during June, compared to 339 units at $21 million in June, a joint report of the Census Bureau and Civil Aeronautics Administration reveals.

Engines shipped for civil aircraft amounted to 579 totaling 400,900 hp., a 5% increase in number and slight boost in horsepower related to shipments of the preceding month. Engine manufacturers shipped 524 powerplants totaling 400,600 hp. in June.

Airframe weight of the 2,665 aircraft shipped during the first seven months of 1953 totaled 5,997,000 lb. They were valued at $123.3 million. At the end of the same period last year, the total value was $111.4 million.

Backlog of aircraft orders for civilian planes of 3,000 lb. airframe weight and heavier amounted to 353 at the end of July, a decrease of 24 planes from the total at the end of June.

RADIOGRAPHY prevents waste



Radiograph of an iron casting for a reciprocating ram.

when a $2 casting gets a $375 treatment

This is a casting for a reciprocating ram. It is to be machined and hand scraped to a final flatness of less than .0001 inch. Should porosity show up during machining, the cost of work done and heat treatment is wasted. The part must be scrapped, not scraped.

But radiography avoids that. By x-raying every casting, flaws are discovered before work is started . . . before hundreds of dollars have been invested in machining and heat-treating costs.

This is another example of the savings possible through radiography.

If you'd like to be sure all your castings are sound—if you'd like to know ways to improve yield in production runs—get in touch with your x-ray dealer. He'll gladly talk it over. Or, if you like, write us for a free copy of "Radiography as a Foundry Tool."

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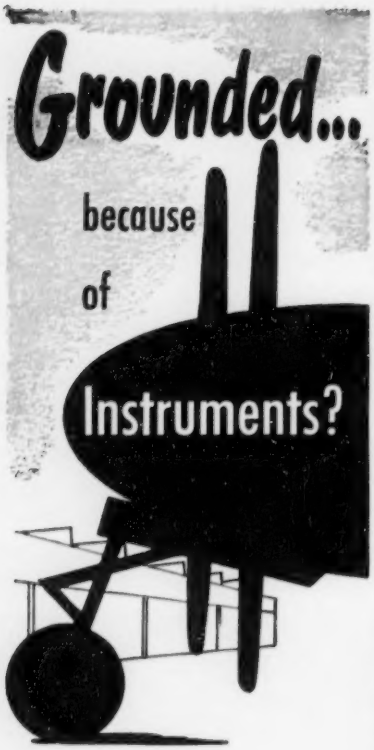

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Jet Crash Angers Van Nuys Residents

Los Angeles—Crash of a Lockheed T-33 jet trainer into a Los Angeles suburb recently brought demands for closing of the Van Nuys, Calif., Airport and an end to jet flights over congested Southern California areas.

The angry public reaction to the crash was reminiscent of that stirred up by commercial airline crashes in Elizabeth, N. J., the winter before last. Significantly, however, the protests are directed specifically at jet aircraft.

The T-33, piloted by Capt. Samuel Fant on an acceptance flight from Lockheed Aircraft Corp.'s Van Nuys plant, smashed into a home just short of the airport runway after a flameout. One woman was killed and two other persons in the house injured. Two children in the backyard narrowly escaped when the skidding aircraft halted inches from where they were playing.

▶ **Praise for Crew**—Capt. Fant and his passenger, Capt. Howard W. Rhodes, suffered only minor injuries. Their commanding officer, Maj. E. J. Rockham, praised Capt. Fant for his attempt to set the plane down in a vacant lot. "Under the circumstances," Rockham said, "he made the best possible landing. It was a miracle that there wasn't greater loss of lives."

The jet trainer skidded for several hundred yards after impact, smashed a small trailer, wrecked a parked car and sheared off an orange tree before plunging through the home.

The day following the crash the Los Angeles City Council protested the use of airports in congested areas by jet aircraft. The council unanimously asked the airport commission to investigate.

"We should determine if jet planes should be allowed training flights within the city," said Councilman Robert M. Wilkinson. "Perhaps they could be permitted to take off and land if there is sufficient runway."

(Lockheed executive vice president Courtlandt S. Gross later pointed out that there are no jet training flights at the Van Nuys Airport.)

Councilman L. E. Timberlake, who lives near Los Angeles International Airport, commented: "Jets come over my house and the whole house shakes and so do all the residents in the area."

▶ **Lockheed Picketed**—The next day nearly 200 women and children picketed the Lockheed plant at Van Nuys in protest. They carried hand-made signs with such inscriptions as:

"School starts! Jet killers make peace impossible."

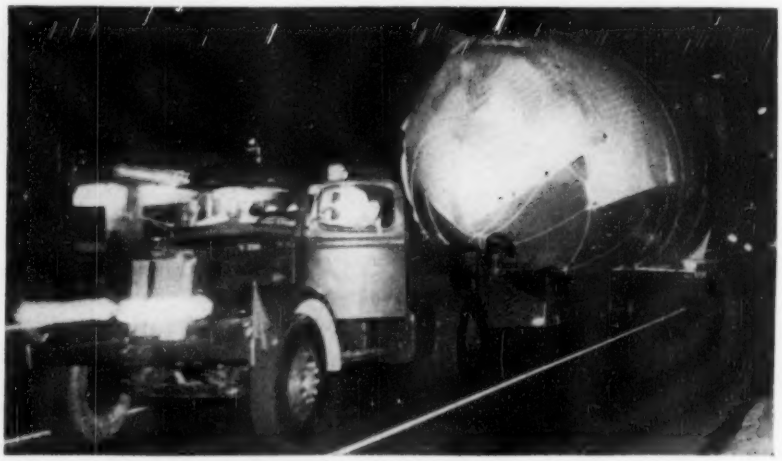
"This airport is a menace to the safety of our community."

The signs called for an end to all jet plane flying over the San Fernando Valley and an end to Air National Guard operations at the airport. The leader of the citizens' group said it seeks complete abolition of the Van Nuys Airport but will wait to see what action city officials take.

▶ **Doolittle Comments**—Gen. James Doolittle, visiting the city, was pulled into the controversy by newsmen when he noted that the question of airport location was included in a survey he conducted for the government.

"In the first place," said Doolittle, "most airports were originally built way out—in isolated sections where there were no residences. The residential areas sprang up around them.

"If you now move the airports away



C-130A Mockup Takes Long Trip

Carefully wrapped, the virtually intact 25-ton mockup of the new Lockheed C-130 turboprop assault transport is seen being trucked through Georgia following a long land and sea voyage from Burbank, Calif., to Marietta, Ga., via the Panama Canal. The new four-engine USAF transport is scheduled for production at Marietta.

KEEN NOSES FOR A FIGHTER

WHAT you see pictured here soon will be nose sections on new Chance Vought F7U-3 aircraft, housing the electronic nerve center of these spectacular jet fighters.

They are void-free honeycomb sandwich "radomes" or electro-magnetically transparent enclosures made of glass fabric and liquid resins which permit the searching fingers of the ship's radar to reach out and probe—unrestricted by the conventional metal surface that usually forms an aircraft's outer skin.

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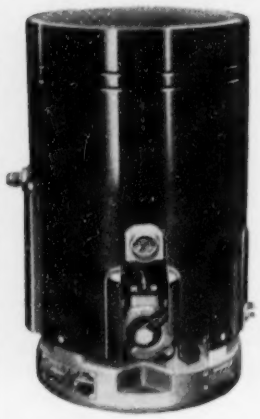

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Fiberglass Pneumatic Receivers	X	X	
Electrical & Electronic Control Systems			X
AC & DC Motors	X	X	X
Small Accessory Turbine Drives	X	X	X
Pneumatic Valves, Operated Electrically or Mechanically	X	X	
Solenoids, Intermittent or Continuous Duty	X	X	X
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from the residences, the people will follow them. Or if you move them so far away that they are completely remote from the cities, how can they be accessible to people who travel by air?" he stated.

Doolittle's cool words did little to quench the angry fire, however. At week's end the protest still was making headlines.

New Decrees Revise Air France Setup

(McGraw-Hill World News)

Paris—Premier Joseph Laniel's government has published two decrees ordering a substantial reorganization of the French air transport industry.

Under the first decree, the national carrier, Air France, will be partly denationalized. A public offering of Air France stock will be made to provide funds for the continuation of the line's re-equipment program. Amount of public participation in ownership and management of Air France has not been determined, but it is presumed the government will retain a majority interest.

New financial setup will make it possible for the government to limit its subsidies to payments for certain flights which, though commercially unprofitable, are considered to be in the national interest. The public stock offering is made possible by the fact Air France is operating at a profit: 1952 net amounted to $314,000.

▶ **Second Decree**—The second decree gives the Ministry of Civil Aviation broad powers to regulate air traffic in order to avoid what is termed "sterile competition."

The ministry will have power to divide air traffic between Air France and private French carriers by limiting the number of airlines authorized to fly particular routes and by splitting up traffic on some more important routes according to quotas.

Air France and Compagnie Generale de Transports Aeriens, one of the big privately-owned airlines, have reached an agreement to share air traffic between France and Algeria. This agreement gives Air France 55% of the traffic and CGTA 45%. It is expected to be far more difficult to reach an agreement among carriers operating between France and Morocco.

S & W Officers Buy 3,300 Stock Shares

Biggest stock transactions reported by the aviation industry to Securities & Exchange Commission last month were purchases of 3,300 common shares

"DME/VOR MOST USEFUL NAVIGATION AID AVAILABLE"

...says Cole H. Morrow of J.I. Case Co.

The J. I. Case Company, manufacturers of power farm machinery, have been flying experimental DME since December 1952 in one of the company's planes. Shown above are Elmo Halverson, Chief Pilot, Paul Johns, Pilot, and Cole H. Morrow, Chief Plant Engineer, looking at the DME antenna.

Mr. Morrow, who is also Chairman of The National Business Aircraft Association says, "When all the present DME ground equipment is installed and operating, the air-borne VOR and DME will provide business aircraft operators the most accurate and useful navigation aid that has ever been available."

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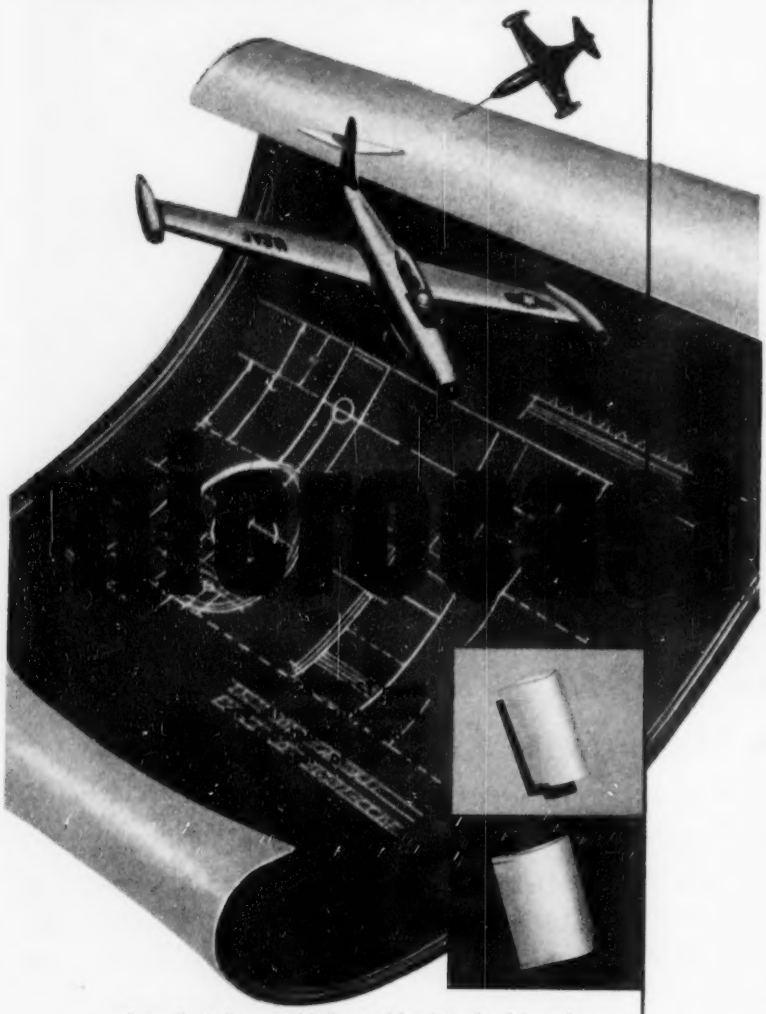

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of Seaboard & Western Airlines stock by three officers of the company.

Arthur V. Norden bought 2,000 shares, boosting his total holding to 36,421 shares; Wallace P. Neth purchased 1,000 to make a total of 1,526; and Harold Montee bought 300, bringing his total to 2,700.

Other stock transactions:

Air Associates Inc.: C. Kenneth Baxter, director, bought 200 common shares, making a total of 700; Stephen A. McClellan, director, bought 200 common shares, making a 600 total, and 200 6% cumulative convertible preferred shares, of which he now has 400; Hillsboro Plantation, Inc., beneficial owner, bought 200 shares of 6% cumulative convertible, making a total holding of 14,281 shares.

Aro Equipment Corp.: A. N. Abelson, officer, sold 1,200 common shares, leaving a 1,222 total.

Avco Mfg. Corp.: Irving B. Babcock, director, sold 700 capital shares, leaving a total holding of 10,097.

Boeing Airplane Co.: William M. Allen, president, bought 112 common shares to make a total of 3,600; James E. Prince, vice president, received 56 common shares as compensation and bought 44 other shares to give him a total of 400.

Braniff Airways, Inc.: Charles E. Beard, officer, bought 1,000 common shares, bringing his total to 1,100; Thomas F. Ryan III sold 1,000 common shares, leaving a 49,000 total.

Cessna Aircraft Co.: Sheldon Coleman, director, bought 100 common shares, making a total of 600.

Colonial Airlines, Inc.: Francis Hartley, Jr., director, bought 500 common shares, making a total holding of 1,000.

Douglas Aircraft Co., Inc.: Frederick E. Hines, officer and director, acquired 200 capital shares through exercise of option, his total holding.

Flying Tiger Line, Inc.: Robert W. Prescott, president, bought $2,000 worth of 5¼% convertible debentures, boosting the value of his holding to $122,000.

National Airlines, Inc.: Salim L. Lewis, director, disposed of 1,000 common shares through Bear Stearns & Co., beneficial owners. Bear Stearns holds 14,000 shares, and Lewis 500.

Northeast Airlines, Inc.: Grenville L. Hancock, director, bought 100 common shares, his total holdings.

Northwest Orient Airlines, Inc.: William Stern, director, bought 200 common shares, making a total of 1,700; Albert J. Weatherhead, Jr., director, bought 200 common shares, his total holdings.

Piper Aircraft Corp.: Walter C. Jamouneau, secretary, sold 100 preferred shares, leaving a 500 total.

Trans World Airlines: Powel Crosley, Jr., director, acquired 309 common shares through trusts, making a total of 1,509.

United Air Lines, Inc.: S. P. Martin, officer, sold 200 common shares, leaving a 200 total.

United Aircraft Corp.: Frederick O. Detweiler, general manager of UAC's Chance Vought Division, bought 150 common shares, making a total holding of 262.

Westinghouse Electric: Gwilym A. Price, president, sold 1,000 common shares, leaving a 4,350 total.

DH-Canada to Design New Light Transport

De Havilland Aircraft of Canada has been granted a $257,774 contract by the Canadian government for design and development of a new light transport plane.

The firm also has won a $27,500 award to work out a wheel-ski arrangement for aircraft.

The awards were made known by the Canadian Department of Defense Production, Ottawa. The department revealed it had let contracts totaling $714,000 for aircraft parts and equipment during the July 16-31 period.

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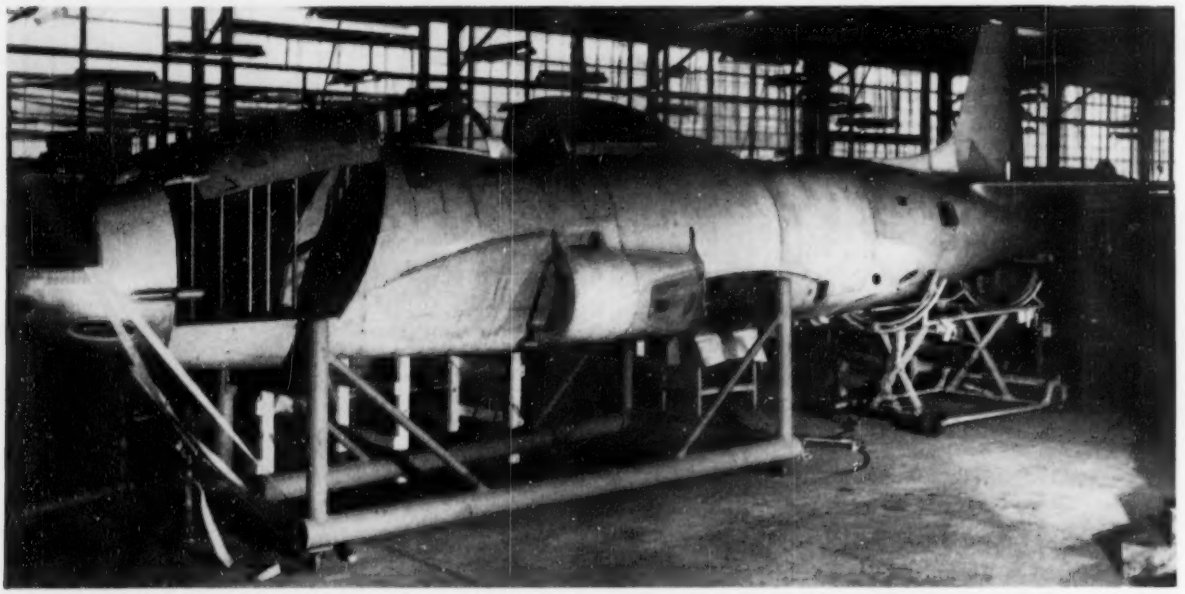


MAGNESIUM FUSELAGE is shown taking shape at East Coast Aeronautics plant. ECA made experimental magnesium wing for F-80.

AMC to Test All-Magnesium F-80C

USAF evaluation will show if performance of experimental light-metal plane matches its production possibilities.

By Irving Stone

The future utilization of magnesium as a structural material in aircraft is under consideration at Wright Air Development Center. At least two types of planes—a new trainer and a new fighter—are being actively considered for all-magnesium makeup. A definite policy on the exploitation of magnesium's potential in airframes is expected to be formulated in the very near future.

This new interest in the material comes at a time when the Air Materiel Command is getting ready to evaluate the first jet-powered, combat-type, "all-magnesium" aircraft as the final phase in a basic experiment aimed at lower cost, simplified structure.

The plane which AMC will check is a Lockheed F-80C, with its aluminum alloy structure redesigned and fabricated from magnesium alloys by East Coast Aeronautics, Inc., Pelham Manor, N. Y., under experimental projects.

▶ **Wings, Then Fuselage**—Components for the all-magnesium F-80C were constructed by ECA under two separate contracts, one for the wing (AVIATION WEEK July 4, 1949, p. 26) and one for the fuselage.

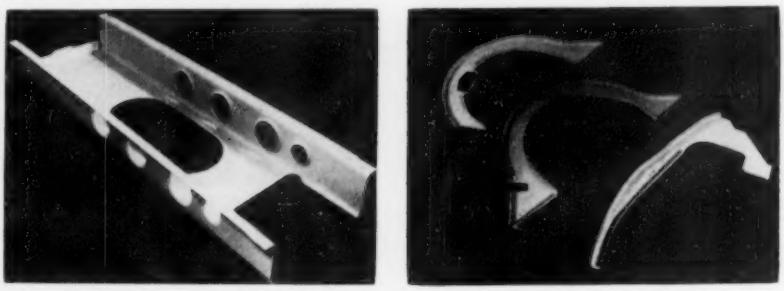
This story carries first details on how ECA made the magnesium fuselage.

▶ **Thicker, But Lighter**—A pioneer in the field of magnesium structures, ECA sees magnesium alloys as permitting the use of thick skins with no weight increase, allowing the elimination of stiffening members and fasteners. This use of fewer parts cuts manhours for engineering, design and manufacture of tools, parts fabrication and assembly. Lower manhour requirements add up to reduced cost of structure.

Speed of aircraft in the immediate future will not bar use of magnesium alloys. For an equilibrium skin temperature of 250F, a value claimed safe for the material, sea level speed would be close to 1,100 mph., and at 60,000 ft. close to 1,400 mph.

• **In the wing project,** East Coast reported a considerable amount of simplification achieved. In comparison with about 1,640 pieces and 42,700 fastenings in the original aluminum alloy wing, the ECA-built magnesium structure contains only about 508 pieces and 16,000 fastenings. Both static and flight articles passed testing.

• **Fuselage project was begun** by ECA in mid-1950 and also covered a static test and a flight article. In addition to the body proper and empennage, this phase of the work also included



HOT-FORMED parts include 3-ft. cockpit floor tunnel (left) made on press brake and bulkhead sections of .064-in. Dow FS-1h24 magnesium made on hydraulic press.

the construction of ailerons and flaps in magnesium. These two surfaces had not been included in the wing job.

▶**Tests Soon**—The static test fuselage was delivered to AMC in June. It is scheduled for early testing and will be teamed with an aluminum alloy wing which merely will be used for support purposes in the trial.

The flight article is slated for delivery early in 1954. This fuselage and tail combined with a pair of magnesium wing panels previously built by ECA and stored there will comprise the all-magnesium F-80C to be flight-proved by AMC.

▶**Interchangeability Required**—Actually this F-80C is only a partial-proving vehicle for the benefits of magnesium as a structural material. Although it did afford an opportunity to develop a means of fabrication to meet new design and production problems and generally point up the advantages involved in using the material, the limitations imposed by the transition from an established design in aluminum alloy to one in magnesium necessarily involved many compromises.

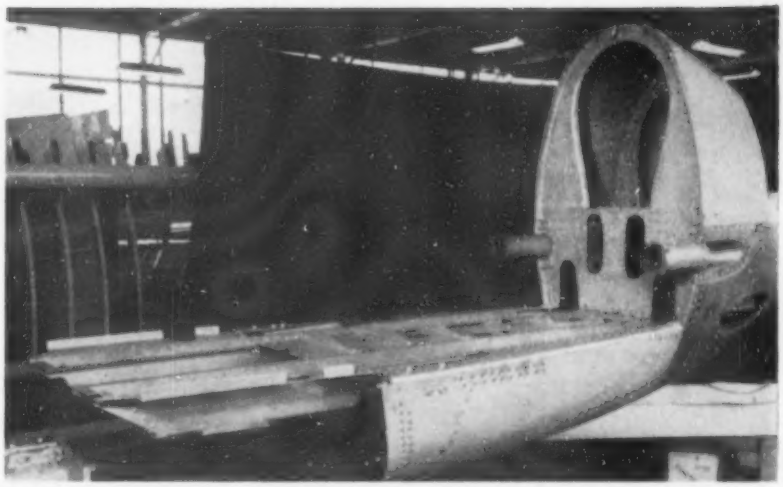
Main limiting factor was the requirement of interchangeability of fuselage, wings, ailerons, flaps, tail and landing gear, with the prototype F-80C's corresponding parts in aluminum alloy.

Another established design recently adapted to magnesium by ECA is the Grumman F9F-2 Panther wing (AVIATION WEEK Sept. 1, 1952, p. 21).

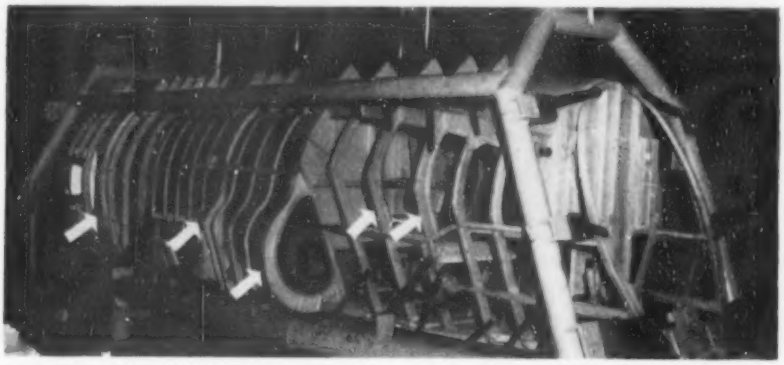
▶**Design From Scratch**—The F-80 and F9F projects in magnesium do not take full advantage of the metal's properties, it is claimed.

The only way of establishing the degree of simplification and cost reduction attainable with magnesium is to design from scratch an airframe incorporating the overall use of the metal.

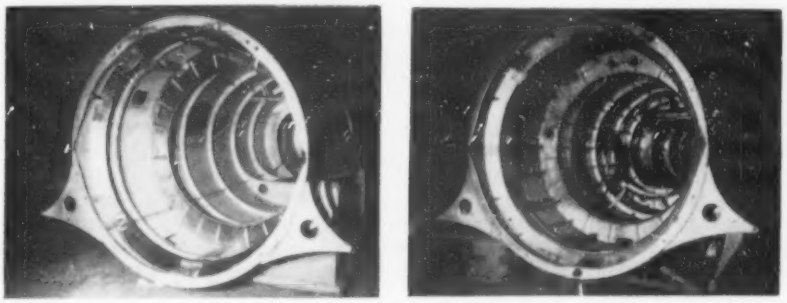
Indicative of this approach is ECA's design submitted in a USAF jet trainer design competition. This configuration with its all-magnesium airframe is reported to embody a degree of simplification which would enable it to be produced in volume for considerably less than a competitive design in conven-



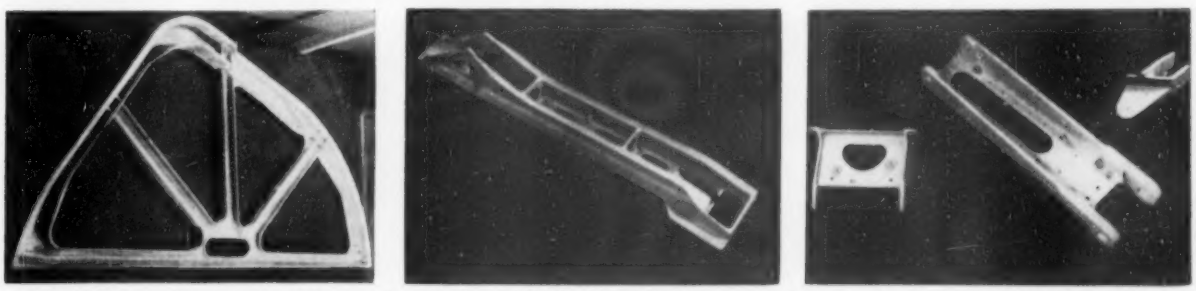
MAGNESIUM NOSE CONSTRUCTION: No stiffeners in upper forward section; remainder follows aluminum design closely, because of gun installation problems.



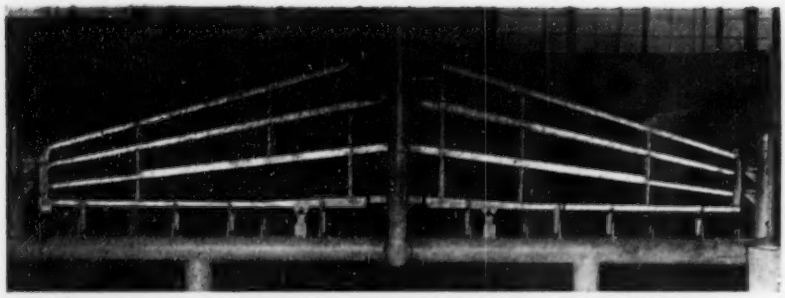
MIDSECTION, with forward end at right, rests in fixture. Note absence of stringers in this magnesium version. Arrows point to cast magnesium members.



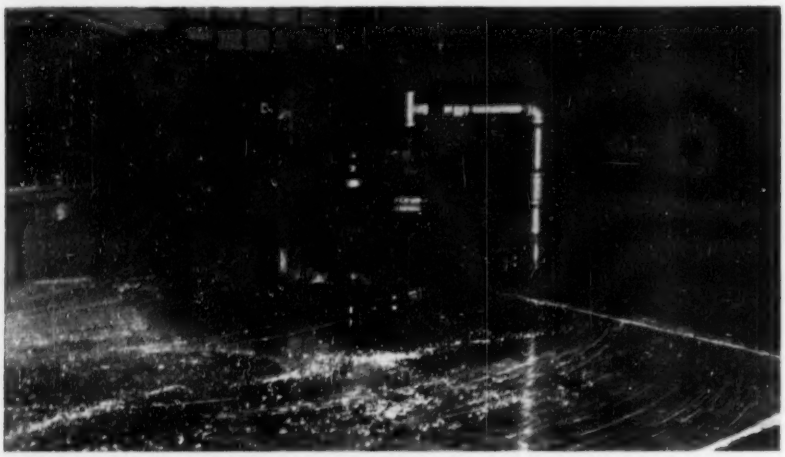
F-80 AFT FUSELAGE in magnesium (left) and aluminum (right). Magnesium is lighter, can be used in greater thicknesses, eliminating need for stiffeners.



CAST PARTS used in experimental magnesium fuselage might be abandoned in large-scale production because of added machining it entails. Spokes in bulkhead section (left) prevent warpage in casting; they are cut away later.



MAGNESIUM stabilizer has half as many ribs as conventional Lockheed design.



TAPER on horizontal stabilizer skins is obtained with arm-router arrangement.

tional aluminum alloy construction.

▶ **First Details**—Here are the details on how ECA constructed the fuselage, tail, ailerons and flaps to complete the all-magnesium F-80C.

Because of interchangeability requirements, the magnesium nose section layout had to maintain the same gun locations, nose gear attach points, and attachment locations of nose section to the fuselage midsection. As a result of these restrictions, very little modification was accomplished in this section.

In general, material gages were boosted to give the required strength in magnesium alloy. This usually gave a heavier gage for an equivalent weight in aluminum alloy.

By reason of the heavier (about 40%) gage skin used—resulting in a higher buckling allowable—the skin stiffeners were eliminated in the upper nose section.

All skins and bulkheads, except some sheet in the lower part of the section, were fabricated from Dow Chemical's FS-1h-24 magnesium sheet. All longerons were fabricated from Dow's ZK-60A-T5 extrusions.

▶ **Midsection, Castings**—In the fuselage midsection, the heavier gages used for skin, bulkheads and frames also permitted the elimination of all skin stiffeners, except in the aft lower section. However, the interchangeability requirement dictated the retention of the main structural load-carrying longerons as in the standard aluminum alloy F-80C.

Sheet and extrusion material was same as that used in the nose section.

Other simplification involved the use of magnesium castings instead of built-up fuselage members. This was done to reduce the number of parts where possible, even though casting machining-penalties were involved. In a production version (as distinguished from this experimental version) it is possible that it might be feasible to use built-up members instead of the castings because of the machining manhours and machines involved.

Cast members included the second and third upper frame portions forward of the aft pressure bulkhead, because of the greater rigidity requirements in the pressurized area.

Other structural members adapted to castings were the air scoop bulkhead, the forward and aft wing attachment bulkheads (each casting extending from the vertical centerline at the bottom to about 135 deg. towards the top), and a portion of the flap actuator support frame.

▶ **Aft Section**—Magnesium construction in the aft section also permitted the elimination of the longitudinal stiffeners. Five longerons were retained, with four of these running the full length of the section and also serving as the skin splices. A fifth longeron located at the bottom center runs aft for about half the section length. Longerons are ZK-60A-T5 extrusions, while skin is FS-1h-24 sheet, as in the other sections.

Non-magnesium members in the aft section are the firewall bulkheads and those supporting the tail section. These members are stainless steel.

▶ **Stabilizer Details**—The stabilizer represents an interesting conversion from aluminum to magnesium. The aluminum structure had two beams, eight chordwise ribs, and longitudinal stringers in each panel. The magnesium structure utilized three beams and four ribs per panel.

Beam material is ZK-60A-T5 extrusion, machined with straight taper towards the tip. Forward and rear beams are made up of two L-shaped members riveted together to form a channel with the open end aft. The intermediate beam is made up of two T-sections with vertical webs riveted to form an I-beam section.

Ribs are sheet metal webs with extruded caps, except for the tip rib, which is all sheet metal.

▶ **Tapered Skin**—To obtain maximum beam bending efficiency and to avoid skin splices, the horizontal stabilizer was designed to use machine-tapered magnesium skin extending in one piece from root to tip on each panel. The skins are 82 in. long, measure .172 in. at the root and taper to .040 in. at the tip. Maximum width of skin is about 36 in.

The sheet was machined from hard-rolled material conforming to Federal Specification QQ-M-44, condition H.

Tapering was done on an ECA-modified arm router arrangement, using a vacuum holding table fixture. The taper was obtained by tilting the vacuum bed at the slope of .0192 in./ft.

▶ **Nose Piece**—The bend radius involved in the leading edge skin posed a problem. This was solved by using a machined extrusion for a leading edge insert, with a recess in the aft portion to receive the flush-fitting skin.

Initially it was thought that a casting could be used for the leading edge insert to avoid excessive machining, but warpage difficulties encountered with the casting caused this attempted use to be abandoned. For a production project, it is likely that the casting problem would be pushed to a satisfactory solution.

In the transition of the stabilizer from aluminum alloy to magnesium, about 27 lb. of weight was picked up. The reason attributed for this penalty is that ECA was requested by AMC to design the stabilizer for a much higher load—about 2.4 times standard.

▶ **Castings in Flap**—The magnesium

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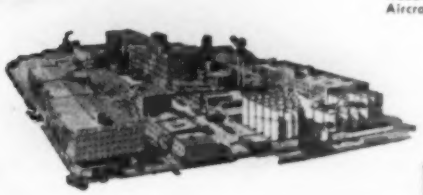

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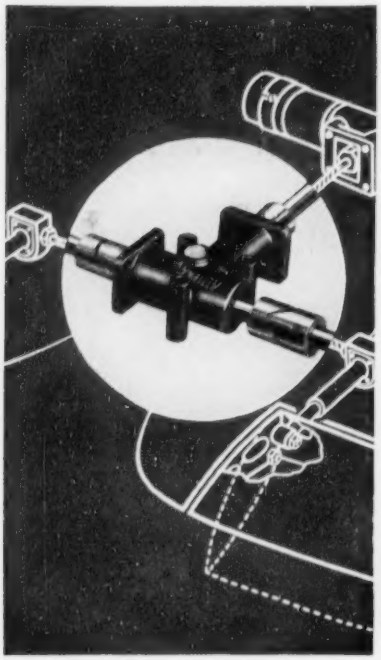

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rudder, fin, elevator and aileron are basically the same as their aluminum alloy counterparts, except for the elimination of a few ribs.

In the flaps, all ribs were eliminated and spider castings—four per flap—installed between the hinge points and the trailing structure. The castings serve to take the load of the flap.

▶ **Hot Work**—ECA has found that the working of magnesium alloys at elevated temperatures requires development of new shop techniques and methods of heating both work and equipment. But working at elevated temperatures does provide these advantages:

- **Parts can be formed** in a single operation, without intermediate annealing and drawing—saving time and intermediate drawing dies.
- **Springback is almost eliminated** at the higher temperatures of the working range.

ECA has found that when magnesium alloys must be formed hot, it is desirable to preheat the sheet or extrusion to working temperature. In comparison to placing cold sheets in the die, preheating:

- **Assures proper forming temperatures.**
- **Minimizes distortion** resulting from internal stresses.
- **Helps maintain dies at uniform temperature.**
- **Boosts production rate.**

When parts are relatively small, preheating is not necessary, ECA reports, since the part will absorb sufficient heat for forming from the die, without reducing die temperature to any great extent.

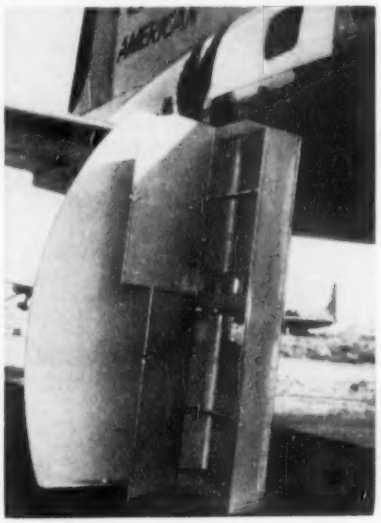
A temperature limit of 350F was selected at ECA for all hot forming operations on FS-1h-24 sheet. This temperature results in a maximum exposure time (during forming and handling) of about 15 min. based on compressive yield strength, and about 20 min. based on tensile yield strength.

Plastics Aid in DC-6 Conversion

Reinforced plastics figure importantly in the recent conversion of 12 American Airlines DC-6s to high-density tourist configurations by Lockheed Aircraft Service-International at N. Y. International Airport, Idlewild.

LeConte Plastics Co., Inc., Farmingdale, N. Y., fabricated overhead luggage racks and water tank compartment of laminated plastics. Use of these plastic parts is reported to have saved considerable weight and installation time.

Conversion of the metal racks—which formerly held blankets, pillows, hats and coats, overnight bags and briefcases—to plastic-sandwich installations for holding luggage was accomplished with an ample deck and divider-web arrangement, which can take a 400-lb. downward load on the deck or a forward load of 600 lb. against the web. The



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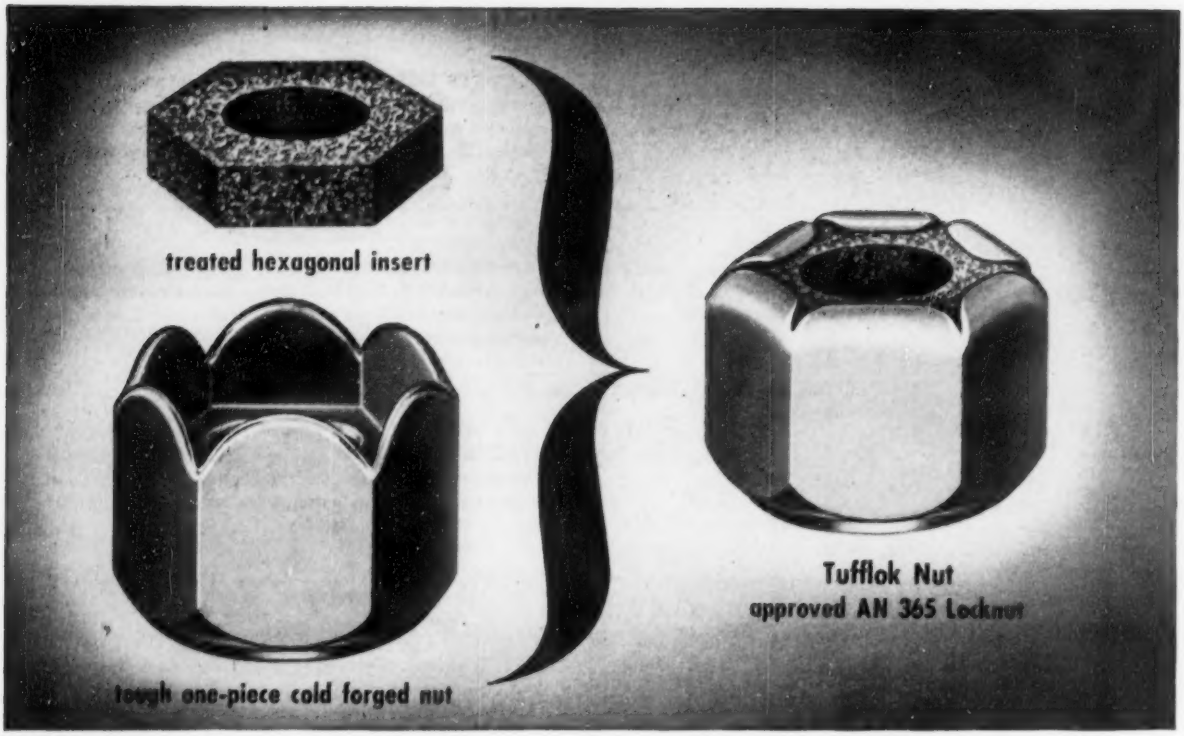

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installation is reported to have saved 143 lb.

The deck is made of 80-in. sections of Strux cellular-cellulose-acetate core sandwiched between Fiberglas faces. The triangular dividers also have Strux cores, sandwiched between skins of Hess, Goldsmith's 164 glass fabric with Volan finish, impregnated with polyester resin. The dividers are inserted in and bonded to aluminum channel cap members. A two-point mounting secures the dividers to the cabin structure.

The deck is bolted to the underedge of the dividers. An aluminum handrail mounts on the inboard edge of the deck and the lower portion of the inboard end of the dividers.

The water tank compartment—an integral part of cabin partition—is used for mounting the metal tank. It is constructed of the same materials used in the rack decks, and is faced with a mahogany Flexwood laminate. The compartment is constructed as a complete unit and is secured to the floor with four bolts; overhead fastening is with two bolts.

Aircraft Unions Join Forces in Wage Talks

United Auto Workers (CIO) and the International Association of Machinists (AFL) will combine forces in forthcoming contract negotiations with United Aircraft Corp., using a unified strategy that is scheduled for 1953-54 wage bargaining with other airframe and engine manufacturers.

Union leaders say the two labor organizations have developed an "overall policy for unity of approach in the aircraft field," a program that stems from the recent "mutual assistance" agreement between IAM and UAW.

The unions are scheduled to combine against UAC in:

- **Bargaining** for "sharp improvement" of contracts at all United Aircraft plants.
- **Launching** membership drives among the corporation's employes.

The IAM-UAC agreement covers negotiations at UAC's Pratt & Whitney Aircraft Division plants at East Hartford, Southington, Meriden, Portland and North Haven, Conn.; Sikorsky Aircraft Division, Bridgeport, Conn.; Chance Vought Aircraft Division, Dallas, Tex., and Hamilton Standard Division, East Hartford.

Purpose of the agreement, labor leaders say, is to "strengthen our mutual bargaining position, to further our efforts to establish uniform contract provisons and to remove labor as a competitive factor in dealing with corporations that have multiple plants organized by two unions."

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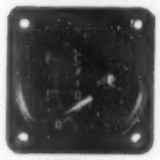
—50 to +300°C Bearing Temp. . . .
0 to +1000°C Exhaust Temp.



MODEL 49B

MODEL 49B, 1⅞" case to AND 10403
—50 to +300°C Cylinder Temp. . . .
0 to +1000°C Exhaust Temp.

MODEL 76B

MODEL 76B dual, 2¼" case to AND 10401
—50 to +300°C Cylinder Temp. (AN 5536-2A or T2A)
—50 to 300°C Bearing Temp. . . .
0 to +1000°C Exhaust Temp.

RESISTANCE TYPE

Accurate ratiometers, these LEWIS indicators are remarkably free of voltage error, have nearly linear scales (not crowded at the ends) and are magnetically shielded. A few typical ranges are given below. Not shown is Model 46B, 2¾" single.

MODEL 47B

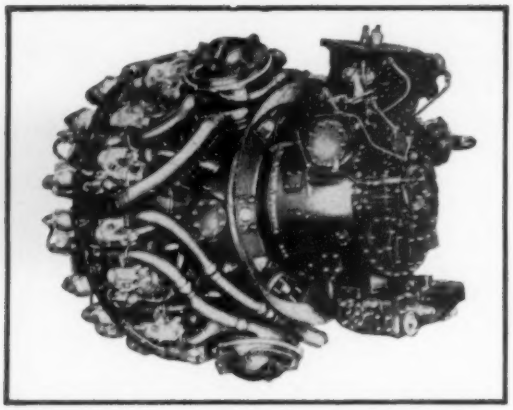
MODEL 47B, 1⅞" case to AND 10403
—70 to +150°C AN 5790-6 or AN 5790T6
0 to +125°C Oil Temp. . . .
—50 to +50°C Air Temp.

MODEL 77B

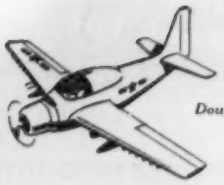
MODEL 77B dual, 2¼" case to AND 10403
—70 to +150°C AN 5795-6 or AN 5795T6
+30 to +230°F Oil Temp. . . .
+100 to +300°C Cylinder Temp.

FOR BEST RESULTS USE *LEWIS* THERMOCOUPLES AND *LEWIS* BULBS WITH THESE INDICATORS

THE LEWIS ENGINEERING CO.
NAUGATUCK, CONNECTICUT
Manufacturers of Complete Temperature Measuring Systems for Aircraft

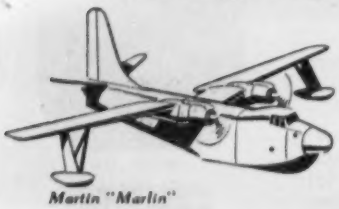


Wright Turbo Compound Aircraft Engine

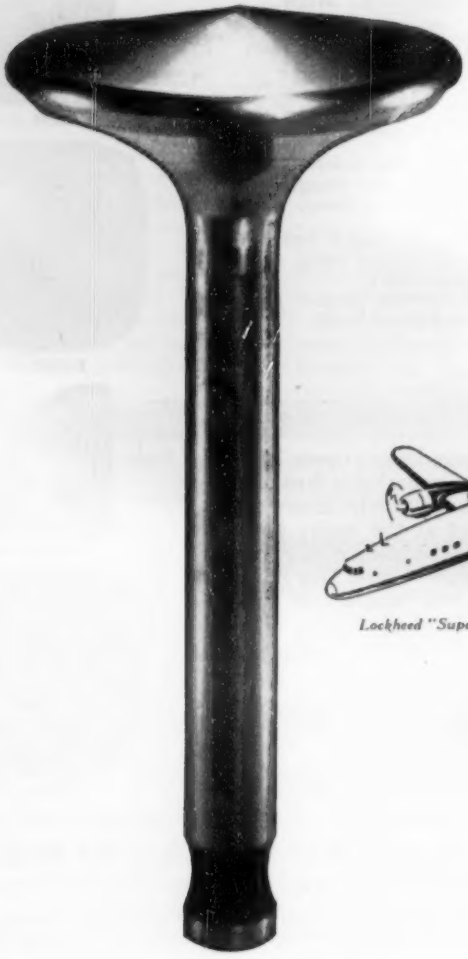


Douglas "Skyraider"

they fly on Wright Engines...
with THOMPSON VALVES



Martin "Marlin"



For a Douglas "Skyraider", a Martin "Marlin" or a Lockheed "Super-Connie" . . . Wright engines deliver the power for smooth commercial flights or teeth-jarring combat maneuvers.

And Thompson Valves are standard equipment for Wright engines of all sizes up to the super-powered Turbo Compound.

Thompson's combination of metallurgical leadership, design excellence, and production capacity assures the owner of a Wright-engined aircraft of dependable service with fewer non-scheduled overhauls, and at minimum cost for valve maintenance.

Lockheed "Super Constellation"

VALVE DIVISION

Thompson Products, Inc.

CLEVELAND 17, OHIO

USAF Contracts

Following is a list of recent USAF contracts announced by Air Materiel Command.

James Mfg. Co., Fort Atkinson, Wis., laboratory darkroom AN/TFQ-7, 26 ea., $641,721.

Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst, N. Y., computer and transmitter, 194 ea., $31,542; indicator, true airspeed, 215 ea., $73,325.

Leece-Neville Co., 5109 Hamilton Ave., Cleveland, motor assy., 1,370 ea., 1,004 ea., 240 ea., $225,693.

Leland Electric Co., Div. of Am. Machine & Foundry Co., 1501 Webster St., Dayton, 1,500 VA single phase inverter, 37 ea., 189 ea., $90,400.

Libbey-Owens-Ford Glass Co., Nicholas Building, Toledo, plateglass windshield, 433 ea., $38,611.

Link Aviation, Inc., Binghamton, N. Y., spare parts for E-26 simulator, $556,064.

W. L. Maxson Corp., 460 West 34th St., New York, amplifier, B-10A, 67 ea., $100,461.

Mitchell Camera Corp., 666 W. Harvard St., Glendale, Calif., camera, MP, 15 ea., $136,305.

Morse Instrument Co., Hudson, Ohio, dryer assy., 150 ea., developing reel, 300 ea., $31,425.

National Supply Co., Springfield, Ohio, 350-kw. power facility, 2 ea., $329,930.

Neptune Electronics Co., 433 Broadway, New York, control box, $47,551.

Northrop Aircraft, Inc., Hawthorne, Calif., mobile training unit, $150,000.

Pastushin Aviation Corp., Los Angeles International Airport, Los Angeles, tank assy., 5,500 ea., pylon, alum. alloy, 5,500 ea., $5,269,990.

Perfection Stove Co., 7609 Platt Ave., Cleveland, spare parts, $27,814.

Photographic Products, Inc., 6916 Romaine St., Hollywood, Calif., body camera, 15 ea., case, carrying, 20 ea., magazine, 35-mm., 25 ea., $102,434.

Pittsburgh-Des Moines Steel Co., Pittsburgh, air heater, 1 ea., $53,408.

Polaroid Corp., 730 Main St., Cambridge, Mass., magazine, aircraft camera, 3 ea., $33,000.

Republic Aviation Corp., Farmingdale, L. I., N. Y., spare parts, $277,915.

Robertson Photo-Mechanix, Inc., 3067 Elston Ave., Chicago, darkroom copy camera, 8 ea., $54,000.

Raymond Rosen Eng. Pro., Inc., 32 North Walnut St., Philadelphia 4, telemetering transmitter and receiver systems, $64,216.

Ryan Industries, Inc., 19159 John R. St., Detroit, rate-of-climb indicators, 949 ea., $84,957; A-8B magazine, 37 ea., spares, $28,502.

Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y., misc. spare parts, $662,060.

Solar Aircraft Co., 2200 Pacific Highway, San Diego, Calif., manifold exhaust system, 645 ea., $82,117.

Sperti-Faraday, Inc., Rockwood Place, Cincinnati, A-3 control, 1,621 ea., 769 ea., 350 ea., $117,671.

Standard Steel Works, 16th and Howell, North Kansas City, Mo., semi-trailer, 300 ea., maintenance spare parts, $4,200,080.

Stein Bros. Mfg. Co., 1401 West Jackson Blvd., Chicago, belt safety, shoulder harness, 37,290 ea., $169,669.

Stewart & Stevenson Services, Inc., 3919 Irving Blvd., Dallas, generator sets, 30 ea., $194,264.

Trad Television Corp., 1001 First Ave., Asbury Park, N. J., AN/ARN 12 components, 4,048 ea., $540,772.

Trailmobile, Inc., 31st and Robertson Ave., Cincinnati, semitrailer, van, 9 ea., $155,606.

Tri Electronics Co., 10633 Chandler Blvd., North Hollywood, Calif., mechanism for B-29 wheels, 44 ea., $127,600.

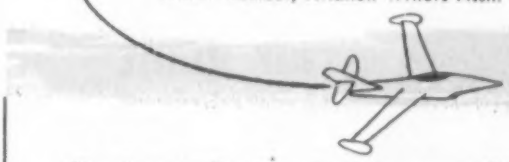
Tucker Sno-Cat Corp., Medford, Ore., Vehicle, Tucker Sno-Cat, 2 ea., 3 ea., 1 ea., $62,846.

United Aircraft Products, Inc., P.O. Box 1035, Dayton, valve assy., 508 ea., 336 ea., 435 ea., $31,194; valve assy., 322 ea., cock assy., 100 ea., cooler assy., 30 ea., $52,483.

Valve Talk

for WM. R. WHITTAKER CO., Ltd.

by Marvin Miles,
Senior Member, Aviation Writers Assn.



The decentralization of prime responsibilities to Air Materiel Areas a year ago by the USAF was a smart move, says Whittaker. This opinion undoubtedly is shared by other parts manufacturers and by the air frame and engine people, too.

Primarily the area division system accomplished two things: It speeded up the exchange of information and resultant action—and it saved taxpayer money.

Prior to this delegation of responsibility, Whittaker field engineers tell me, all repair and supply and quality control was bottlenecked through one central filter point at Wright-Patterson Air Force Base, Dayton, Ohio, AMC headquarters.

When the old centralized system grew unbearably cumbersome, AMC assigned the work of Technical Services, Supply, and other departments at Wright-Patterson to the eight Air Materiel Areas, each specializing in various types of equipment and supplies.

Today, one phone call reaches the right man almost immediately. The Air Force technician at the other end of the line knows nearly as much about valves (in the case of Whittaker) as do the company engineers. He's familiar with the problems and can initiate action at once. In fact, service is so efficient that now three or four situations sometimes can be cleared up in a fifteen-minute phone call.

At the vast Tinker Air Force Base, Oklahoma City Air Materiel Area (OCAMA) headquarters, commanded by Maj. Gen. Fred S. Borum, there are crews of specialists who know every rivet and bolt in Boeing's B-29, B-47, B-50 and C-97, Cessna's C-126 and L-19.

They know certain types of Allison, Pratt & Whitney and General Electric engines through and through and they are experts on variegated equipment such as turbo-superchargers, in-flight refueling gear, aircraft hardware, paints, soaps and dopes; ferrous and non-ferrous metals, chemicals, fuel and oil handling equipment, etc.

Whittaker valves come under the Air Force general designation "03-I" —fuel, hydraulic, vacuum, oil and deicer systems—with the company's individual code designation appended. Hence Whittaker production, as far as the Air Force is concerned, is 03-I-4815.

Similarly all eight AMAs are specialists on various Air Force aircraft and the many types of equipment used, supplied, repaired and maintained; from "Footwear, Female" to "Flags, Bunting and Insignia"; from "Railroad Equipment" to "Live Animals."

It's easy to imagine the chaos that must have developed when all the hundreds of categories were served from one main headquarters. But now the AMAs take care of this gargantuan business—largest in the world—from centers at Oklahoma City, San Bernardino and Sacramento, California; San Antonio, Texas; Middleton, Pennsylvania; Ogden, Utah; Macon, Georgia; and Mobile, Alabama; plus prime depots at Rome, New York; Maywood, California; and Dayton, Ohio. AMC top headquarters still remains at Wright-Patterson, of course.

Whittaker's service engineers know the experts at OCAMA who work with the company's valves. By sharing specialized knowledge with them, they work out difficulties with the utmost dispatch.

If, for example, a change is required by OCAMA, the technician at Tinker phones an unofficial request for an alteration in tech order to Whittaker. The Valve Company takes immediate steps to comply while awaiting the formal order. This applies generally to older aircraft. On aircraft in current production such modifications are handled through the prime contractor.

Meanwhile the company puts a "flag" on the unit production line involved so if more orders come in from other sections, clients can be advised of the forthcoming change to prevent wastage.

The AMAs, supplying the vast needs of the Air Force for the most part, are allowed to purchase on open contract in order to expedite delivery of needed equipment.

Unsatisfactory reports are scheduled at the various AMAs according to code numbers of the units concerned, type of failure, time in stock, in use, etc., with production plants and prime contractors receiving copies. For vital units such as valves, similar copies go also to the Plans and Analysis division and to the Flight Safety Groups of the Inspector General's office.

Whittaker Field Service sums the AMA division efficiency:

"They know what they're doing. As a result, we know where we are. We trade information and experience and solve most difficulties with little or no strain. It's a remarkably efficient system and AMC is to be commended."

it can give even an air giant the "shakes"

MB produces the largest vibration exciter ever built

• There's nothing like a good shaking to test out structural designs for faults and flaws. A form of applied vibration, the shakers to do such jobs are logically part of MB's business. And, to be expected from "headquarters" for vibration engineering, the largest electromagnetic exciter, shown above, has been developed and actually built right here at MB.

This monster delivers 5 tons continuous force for all heavy duty vibration tests under MIL-E-5272 and other specifications. It incorporates a number of unusual design features for easy, quick, convenient operation. This equipment can test the fatigue strength and response to vibration of even the largest air giants.

But that's not all. Still larger capacity units are on MB's boards right now!

Remember—when you're dealing with vibration, deal most effectively with it by drawing on MB's 15 years of cooperation with the aviation industry.

the MB *manufacturing company, inc.*

1067 State Street, New Haven 11, Conn.

HEADQUARTERS FOR PRODUCTS . . . TO ISOLATE VIBRATION

. . . TO EXCITE IT . . . TO MEASURE IT

United States Gauge Div., American Machine & Metals, Inc., Sellersville, Pa., transmitter, fuel pressure, 629 ea., transmitter, oil pressure, 935 ea., 773 ea., $117,404.

Varo Mfg. Co., Inc., 1801 Walnut St., Garland, Tex., converter, 367 ea., $31,745.

John M. Wall, Inc., 107 North Franklin St., Syracuse, N. Y., camera, motion picture, 16 ea., $207,737.

Westinghouse Electric Corp., 32 North Main St., Dayton, generator, 222 ea., 380 ea., $469,711.

Henry Wild Surveying Instruments Co. of America, Inc., Main & Covert Sts., Port Washington, L. I., N. Y., lens, mounts, 2 ea., lens, cones, 2 ea., $69,990.

Navy Contracts

The following contracts were announced recently by the Navy's Aviation Supply Office, 700 Robbins Ave., Philadelphia 11.

Airton, Inc., 20 E. Elizabeth Ave., Linden, N. J., waveguide, $52,164.

Douglas Aircraft Co., Inc., 827 Lapham St., El Segundo, Calif., dispenser assy., 51 ea., $170,165.

General Electric Co., 1405 Locust St., Philadelphia 2, instrument test equipment, $39,258.

Goodyear Tire & Rubber Co., Inc., 1144 Market St. E., Akron 16, Ohio, brake linings used on various aircraft, 160,452 ea., $299,885.

R. M. Hollingshead Corp., 840 Cooper St., hydraulic fluid, 61,506 gal., $193,129.

Marquette Metal Products Co., 1145 Galewood Drive, Cleveland 10, components used on windshield wipers for FJ-2 aircraft motor, $42,206.

Meistrom Mfg. Corp., 376 Ridgeley St., Perth Amboy, N. J., test rack, 64 ea., $25,240.

Vickers, Inc., 1400 Oakman Blvd., Detroit 32, hydraulic motor, 85 ea., $38,670.

Airborne Accessories Corp., 1414 Chestnut Ave., Hillside 5, N. J., actuators for F9F-6, 6P aircraft, 42 ea., $81,909.

Aircooled Motors, Inc., Liverpool Rd., Syracuse 8, N. Y., liner crankshaft, crankcase assy., $44,022.

General Controls Co., 801 Allen Ave., Glendale, Calif., fuel valve assy., $34,391.

Minneapolis-Honeywell Regulator Co., Aeronautical division, 2600 Ridgway Rd., Minneapolis 13, Minn., indicator for R2V-5, 6 aircraft, $69,631.

Moore Business Forms, Inc., 1422 "K" St., N. W., Washington 5, forms for IBM tabulating equipment, $28,120.

Pacific Airmotive Co., 2940 N. Hollywood Way, Burbank, Calif., valve assys. for FJ-2 aircraft, $79,496.

The Permutit Co., 330 West 42nd St., New York 36, desalting, sea water, 20,000 kits, $221,200.

Revere Camera Co., 320 E. 21st St., Chicago 16, actuators for use on various aircraft, 546 ea., $200,544; actuators for F9F-4, 5, 5P aircraft, 379 ea., $133,306.

Harrison Radiator Div., General Motors Corp., 500 Elm St., Lockport, New York, oil cooler for HSL-1 aircraft, 47 ea., $62,304.

Walter Kidde & Co., Inc., 675 Main St., Belleville 9, N. J., valves, $52,798.

North American Aviation, Inc., Columbus Division, 4300 E. 5th Ave., Columbus 16, Ohio, parts used for aviation armament, $44,776.

Pacific Div., Bendix Aviation Corp., 11600 Sherman Way, North Hollywood, Calif., pump assemble., $47,074.

Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, compound, $32,360.

United Aircraft Products, Inc., 1116 Bolander Ave., Dayton, tube oil cooler for various aircraft, 806,000 ea., $33,852.

Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn., material for C-45 aircraft propeller equipment, $146,151; material for R4360-53 engines, 49,072 ea., $62,321.

Pratt & Whitney Aircraft Div., East Hartford 8, Conn., spare parts used on P&W engines, $504,943; spare parts for P&W engines, $1,823,342; spare parts for P&W engines, $973,526; material for P&W R4360 engines, $146,695.

Need low cost, long life, good oil retention?

here's how manufacturers of textile machinery assure them with NEEDLE BEARINGS

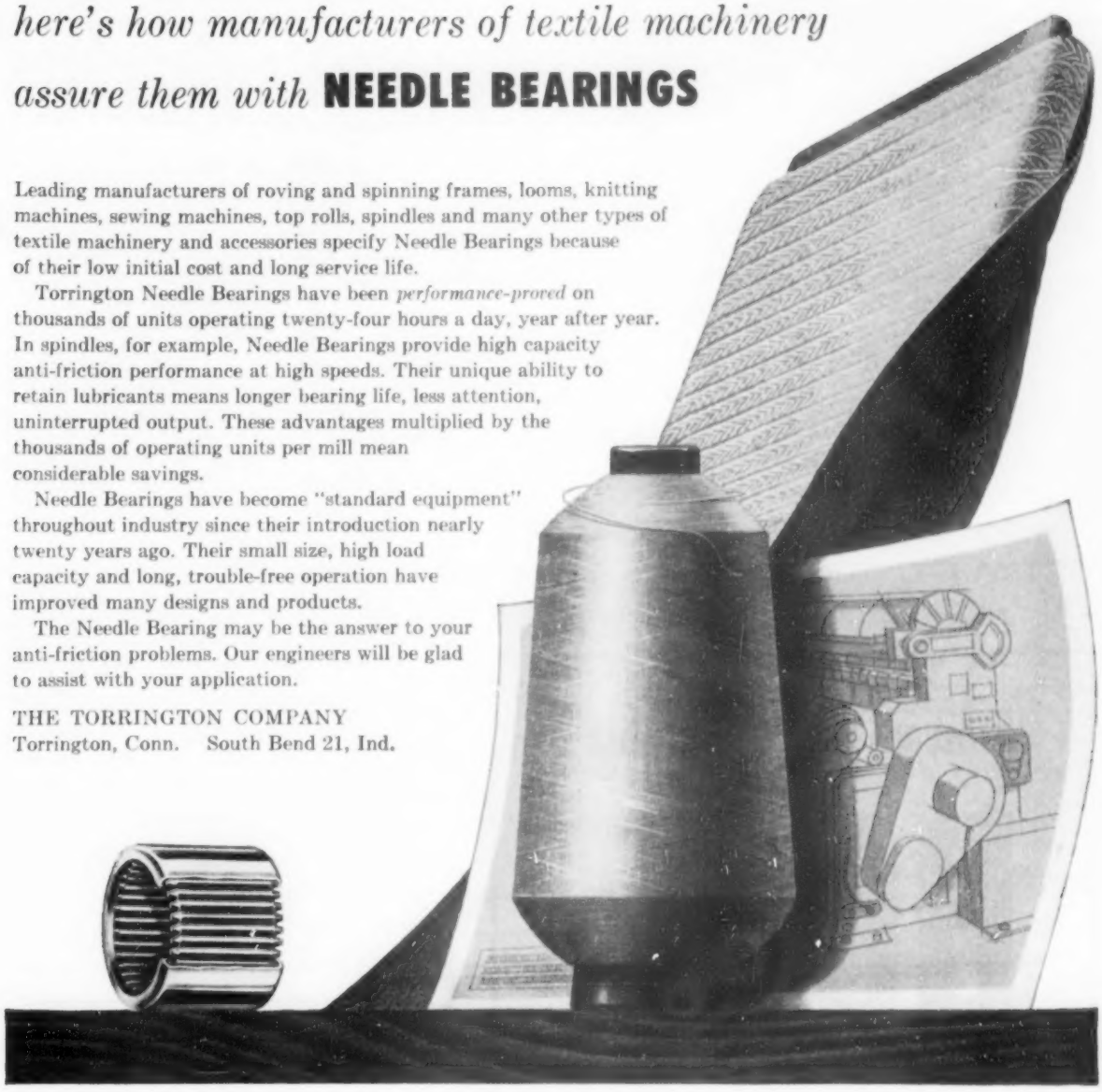
Leading manufacturers of roving and spinning frames, looms, knitting machines, sewing machines, top rolls, spindles and many other types of textile machinery and accessories specify Needle Bearings because of their low initial cost and long service life.

Torrington Needle Bearings have been *performance-proved* on thousands of units operating twenty-four hours a day, year after year. In spindles, for example, Needle Bearings provide high capacity anti-friction performance at high speeds. Their unique ability to retain lubricants means longer bearing life, less attention, uninterrupted output. These advantages multiplied by the thousands of operating units per mill mean considerable savings.

Needle Bearings have become "standard equipment" throughout industry since their introduction nearly twenty years ago. Their small size, high load capacity and long, trouble-free operation have improved many designs and products.

The Needle Bearing may be the answer to your anti-friction problems. Our engineers will be glad to assist with your application.

THE TORRINGTON COMPANY
Torrington, Conn. South Bend 21, Ind.



TORRINGTON *NEEDLE* **BEARINGS**

Needle • Spherical Roller • Tapered Roller • Cylindrical Roller • Ball • Needle Rollers

Trade-marks of leading textile machinery manufacturers who use Torrington Needle Bearings.

WARNER & SWASEY — TEXTILE MACHINERY DIVISION

Union Special

KARL LIEBERKNECHT, INC.

Whitin

FROM HERE TO THERE—*IT'S FASTER BY AIR!*

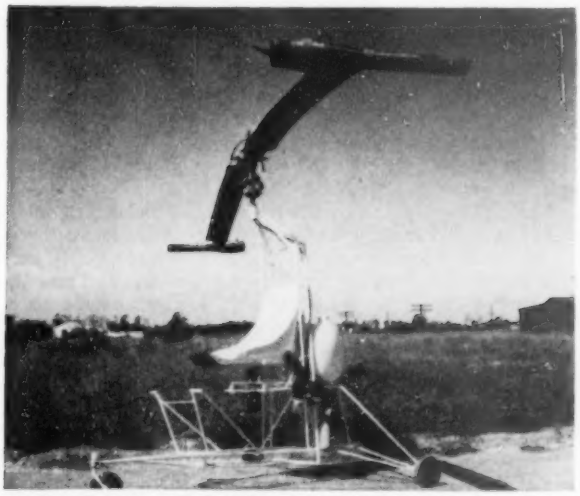
You can get from where you are—to where you want to be—faster by air. That's why—hundreds upon hundreds are joining the thousands upon thousands who yearly travel millions upon millions of miles—by air! Next time—save time—*your time*—fly!

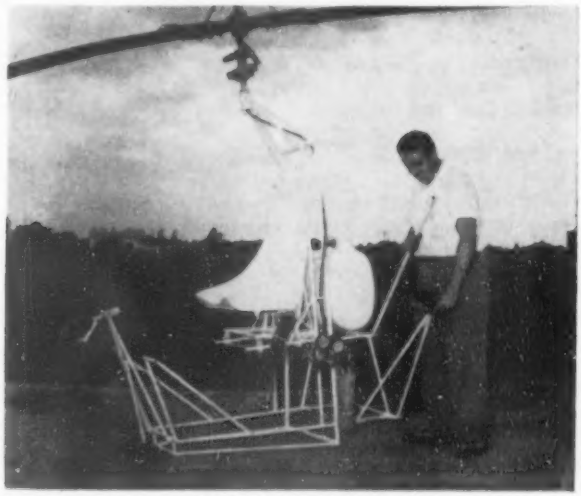
power packages by ROHR

You're boarding a United Airlines Convair-Liner 340—and there on the wing you see the Rohr-built "power packages" ready to wing you along the skyways of the world. For the Convair 240, and its successor, the Convair 340, Rohr manufactures and assembles the engine mount, cowl panels, ducts, exhaust system, tanks and other units which transform a Pratt & Whitney engine into a complete, ready-to-install "power package.

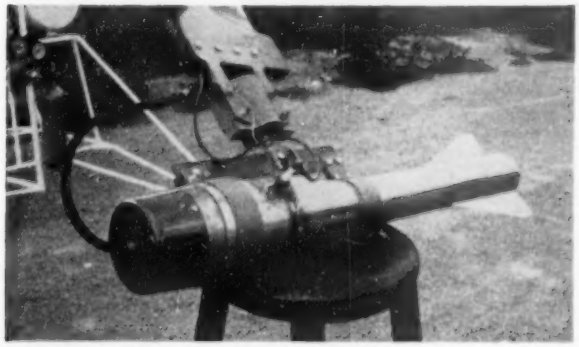
WORLD'S LARGEST PRODUCER OF READY-TO-INSTALL POWER PACKAGES FOR AIRPLANES

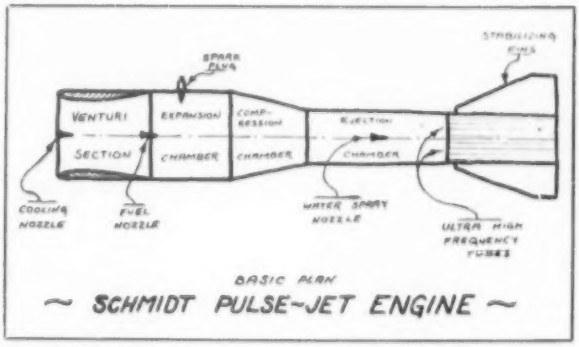
ROHR
AIRCRAFT CORPORATION
CHULA VISTA AND RIVERSIDE CALIFORNIA





ONE-LITTER AMBULANCE for frontline use is mission envisaged for Para-Copter rotorcraft by inventor, George Schmidt.





"ALMOST SILENT" PULSEJET ENGINE used by Schmidt delivers 105 lb. of thrust on special kerosene-base fuel.

Noise Is Cut in New Pulsejet Engine

A small pulsejet-powered helicopter, designed and built by George Schmidt as a combat evacuation craft, is nearing completion at the former Focke-Wulf engineer's Brentwood, N. Y., factory.

Military interest has been shown in the Para-Copter 2 (AVIATION WEEK Sept. 7, p. 9), intended as a one-litter ambulance to fly wounded soldiers from front line areas to points of safety.

▶ **"Silent" Operation**—Schmidt engineered and constructed the 105-lb.-thrust twin pulsejet engines for his new craft, developed a special kerosene-base fuel called JPX, and devised a silencing system that he claims will make the helicopter powerplants approximately 80% quieter than other existing types.

"Almost silent" operation of the machine is projected as a top selling point for military operation and in the civilian market, if the engineer develops a civil configuration of his copter.

▶ **Adjustable CG**—Schmidt based the Model 2 on an earlier, smaller strap-on type of helicopter that he built and flew successively.

The Para-Copter is constructed of welded steel tubing, stands 8 ft. 7 in. high, and has a folding tricycle landing gear of 7-ft. base.

An aluminum seat, located directly under the rotor hub, is adjustable fore and aft for center of gravity balance. The single litter is carried directly under the pilot seat.

▶ **Little Torque**—Schmidt designed rotor controls that extended from the rotor hub but now is installing conventional floor configuration demanded by the latest military specifications.

Practically no compensation for torque is required in the Para-Copter's control surfaces, the designer says, because the only torque existing in the craft is caused by bearing friction. A small fin may be added to correct the friction effect, however, if the need is indicated by future flight tests.

▶ **Powerful Pulsejet**—Schmidt developed several innovations in design, operation and mounting of the helicopter pulsejet engines.

Each powerplant is 32 in. long, 5 in. in major diameter and weighs 17.5 lb. Although smaller than the new British pulsejet developed by Saunders-Roe for copters (story on next page), the Schmidt engine delivers more than twice the former's 45 lb. thrust.

The engine shell is constructed of welded 347 stainless steel.

▶ **Menthol Mixture**—To preserve the life of four valves in each pulsejet, a mixture of menthol crystals dissolved

in alcohol and mixed with water is bled from a high pressure tank into a fuel line mounted just ahead of the throttle regulator. One pint of this coolant is required for each hour of engine operation.

In operation, a small amount of coolant mixed with fuel is sprayed into the pulsejet just ahead of the venturi through a .004-in. hole. The same fuel-coolant mixture is injected into an expansion chamber of the engine through a No. 60 hole.

This combination, Schmidt claims, keeps valves much cooler, preserves their life and gives a better fuel mixture for operation.

▶ **Muffled Pops**—The Para-Rotor's silencing system probably is the first to cut down noise of a pulsejet engine.

Schmidt deadens the loud, pulsating pop in two operations:

• **Nozzle** of .007 in. diameter sprays water into the ejection chamber, where the 1,700F heat turns it into a steam mass that muffles noise. Each engine uses approximately one quart of steam an hour.

• **Thirty-two tubes** of 7-in. long stainless steel are mounted in the tail of the pulsejet ejection chamber, where they change noise that escapes the steam muffle into a high-pitched sound above the level of human reception.

Schmidt claims his silencing system also gives the pulsejet 15-20% greater thrust.

▶ **Folding Package**—Rotor blades on the new copter have a straight chord of 9 in., are hinged to fold at the semi-rigid, see-saw hub.

When the rotors and landing gear are folded, the Para-Copter is a small package that can be stowed aboard a cargo transport and dropped by parachute into forward combat areas.

The Clark Y airfoil of the copter's rotor blades, made of eight layers of laminated sitka spruce and seven layers of nylon, may be shaped and mass-produced by unskilled workers on a special machine designed by Schmidt.

A 7-ft. blade can be cut in six minutes on this machine, he reports.

▶ **Pressurized System**—Fuel system of the new helicopter is a pressure type up to the rotor head, where it becomes centrifugal.

Rotor blades currently have integrally built fuel lines, but they will be removable in the future to facilitate maintenance.

An 18-gal. fuel tank, located behind the pilot seat, gives the Para-Copter an endurance of 1 hr. 10 min. Air pressure of 35-40 lb. in the tank is used to start the pulsejets, but centrifugal forces keeps the fuel flowing after the engines begin burning.

A bottle containing 92 cu. in. of compressed air is carried for starting purposes.

▶ **Simple Overhaul**—Major overhaul of the Schmidt pulsejets after 60 hr. of operation requires less than an hour for each powerplant:

• **Nose venturis** are removed by taking out four screws.

• **Valve plate assembly** is lifted out.

• **New assembly** is installed.

Unlike conventional rotor-tip jet units, the Schmidt engines are not attached solidly to the rotor blade but are installed on a ball-bearing mount that permits the powerplant to swing freely within limits in an up-and-down motion.

Small fins at the tail of the pulsejets and the center-of-gravity mounting keep the engines in a horizontal position regardless of the angle of attack changes of the rotor blades.

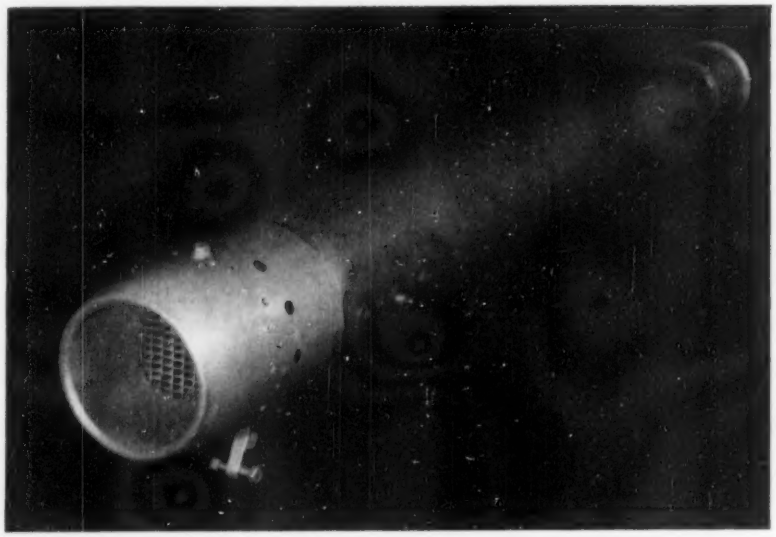
A manufacturer has quoted Schmidt a price of $85 per pulsejet for the first lot of 50 powerplants.

▶ **Strap-On Copter**—Schmidt flew his early strap-on helicopter to an altitude of nearly 12,000 ft. in July of last year. The craft was demolished on a second flight when the designer, unfamiliar with the flying characteristics of his new copter, allowed the rotor-craft to be blown sideways and tipped over by a strong gust of wind.

But Schmidt says he expects to rebuild the small copter.

▶ **Achgelis Engineer**—The German-born engineer worked on Focke-Wulf's Achgelis helicopter before he came to the United States in 1939. He has been employed by several major U.S. aircraft firms during the past 14 years.

Working with Schmidt on the Para-Copter are T. McGeough, chief engineer of the independent company, and engineer M. Simbrow.



British Pulsejet to Power Copters

The pulsejet engine is the most promising means for tip propulsion of rotors, says the Helicopter Division of Saunders-Roe, Ltd., British aircraft firm.

After a year of experimenting, the company has developed a 45-lb.-thrust unit that has logged many hours of test and is working on a 120-lb.-thrust engine.

▶ **First British Pulsejet**—This is the first British pulsejet to propel or lift any aircraft, although similar U.S. engines have powered American Helicopter's XH-26 and Marquardt's M-14 for some time.

The pulsejet, one of the family of aerothermodynamic engines that includes the ramjet, was used by the Germans during World War II to power V-1 buzz-bombs.

▶ **Operation**—A pulsejet engine consists of simple parts: A cylindrical combustion chamber with a spring-loaded, normally open intake valve, and a tailpipe.

In operation, a mixture of fuel and air is ignited in the combustion chamber. The resulting explosion forces gases out the exhaust pipe at high speed and closes the intake valve.

The discharge lowers combustion chamber pressure to a point where the spring-loaded valve is able to open again, and a fresh charge of air is sucked and rammed in. The cycle then repeats.

▶ **Acoustic Tuning**—The Saunders-Roe unit is "tuned" by the acoustic properties of the chamber and tailpipe to a frequency of 120 cycles per second. It can be varied to a maximum of approximately 200 cps. or a minimum of 46 cps.

Engine weighs only about 15 lb. for its 45-lb. thrust. It is 47.5 in. long, and 5.5 in. in diameter.

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SW STEWART-WARNER CORPORATION
South Wind DIVISION

Single Computer Combines Flight Data

- **AF seeks end of signal sensor duplication.**
- **Kollsman unit is one solution to problem.**

By Philip Klass

The many individual sensing elements previously used to provide altitude, airspeed, air density and temperature signals needed in fire control, bombing, navigation, and photo-recon systems appear likely to be replaced by a single central flight data computer in future USAF bombers.

A new Kollsman Instrument Corp. flight data computer (Type C-2), slated for use on two of the USAF's newest bombers, is the first step in that direction.

A more advanced Master Air Data (MAD) Computer which Kollsman is now developing for Wright Air Development Center's Equipment lab, will provide a still larger variety of flight data signals, including true airspeed, mach number, barometric altitude variation, air density and true airspeed.

The C-2 computer weighs 21¼ lb. and measures 10⅜x7x11⅞ in., exclusive of shock mounts. The MAD computer is expected to be slightly larger and weigh approximately 25 lb.

▶**Operates New Indicator**—The C-2 computer also provides signals for operating USAF's new Type P-1 combined airspeed indicator which gives the pilot his indicated airspeed, true airspeed, and Mach number on a single instrument. The P-1's indicated airspeed pointer is driven by a conventional (non-electric) bellows element operating from pitot-static pressures.

C-2 computer signals are used to operate two small servo systems whose motors position the Mach number dial and the true airspeed Veeder-type counter on the face of the P-1 instrument. The P-1, with a 5-in. dial, and the similar ME-1, with a 3-in. dial, were developed by Kollsman under contract with WADC's Equipment lab. (Eclipse-Pioneer Division of Bendix Aviation has also developed similar combined airspeed indicators.)

▶**The Need**—Fire control and gunnery computers need to "know" their own ship's airspeed and the density of the air in order to calculate bullet or rocket trajectory. A bombing computer needs similar information, as well as knowing the plane's altitude.

In most World War II equipments, the bombardier, navigator, or gunner fed this information into the computers by reading flight instruments and manually setting these readings on a set of dials.

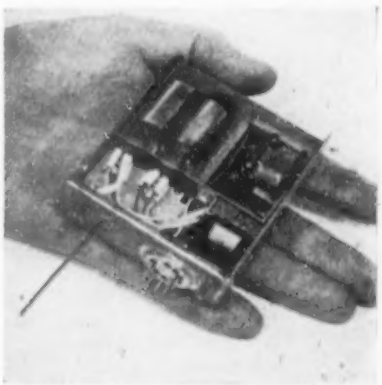
This manual procedure presented the possibility for error, both when the human operator read the flight instruments and when he set in the value observed. If the operator became preoccupied with other duties, the computer operated from incorrect data.

More recently the trend has been toward sensing elements which continuously and automatically measure and transmit airspeed, altitude and similar signals directly to the computers. For lack of a single central source of such signals in the airplane, each manufacturer builds into his equipment the sensing elements he needs, resulting in needless duplication of sensing elements in large aircraft such as bombers.

▶**One For All**—WADC's Equipment lab hopes to eliminate this duplication with a central air data computer, capable of providing signals to a variety of avionic equipments. By so doing, it is possible to justify more data computer design sophistication to obtain greater accuracy than is now feasible in individual sensing elements.

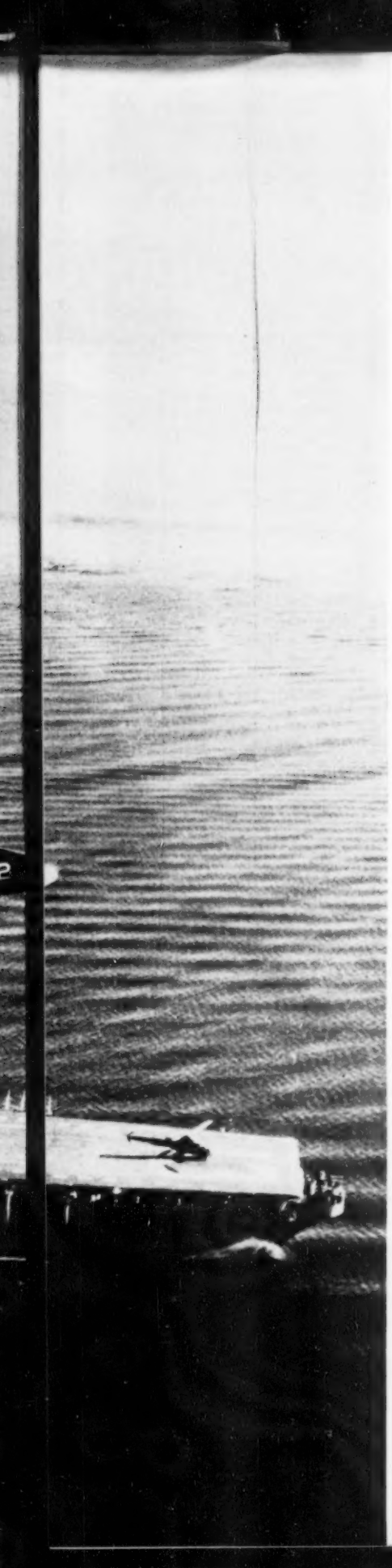
Failure of the single data source will, admittedly, knock out all equipments operating from it. However, two data computers, one a standby, can probably be provided in some types of aircraft at

SINGLE SOURCE of airspeed, Mach number and barometric pressure signals is provided by Kollsman flight data computer (left) for a variety of new avionic equipment, such as new combined airspeed indicator, Type P-1 (right), which shows pilot indicated and true airspeeds as well as Mach number.



ELECTROMECHANICAL calculating mechanism (left) computes true airspeed and Mach number. At right is tiny servo amplifier which is one of three that are used in the Kollsman flight data computer.

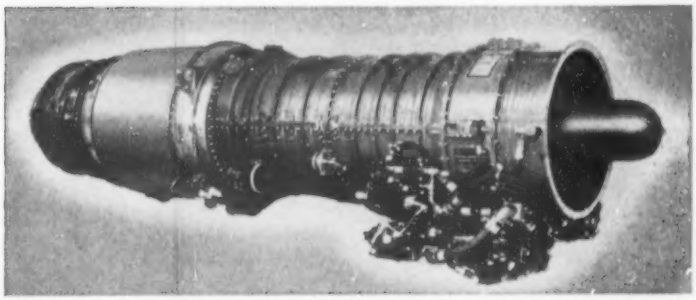
HIGHLIGHTS IN *Jet Engineering*



Once performance and power have been built into military aircraft, engines must make it constantly available to maintain maximum striking power at all times. This factor—availability—is built into every Westinghouse turbojet. From its first American designed axial-flow jet engine, Westinghouse has improved performance, improved materials and structure by testing new designs . . . increasing durability and simplifying all parts, assemblies and components. This has lengthened time allowed between overhauls, streamlined routine maintenance, speeded field service . . . and has made it possible for Navy airplane mechanics to change a complete J34 engine and have aircraft returned to operational status in less than an hour!

The McDonnell F2H-2 "Banshee" has shown how these advantages have paid off in U. S. Navy fleet operation. Its Westinghouse J34 service record, during combat and maneuvers, contributed to the establishment of aircraft availability levels over 80%. Likewise, U. S. Navy records for jet-powered aircraft were made in terms of sorties and hours flown without engine failure.

The more powerful Westinghouse turbojet engines now being qualified and readied for production will offer these same advantages—providing better, more advanced and reliable driving power for both military and commercial air leadership. Westinghouse Electric Corporation, Aviation Gas Turbine Division, Lester Branch P. O., Philadelphia 13, Pennsylvania. J-54027



Twin Westinghouse J34 turbojet engines power the U. S. Navy F2H-2 "Banshee", helping to give it the high performance that has made it outstanding in Korean combat operations.

YOU CAN BE SURE...IF IT'S

Westinghouse

Official U. S. Navy Photograph

little, if any, weight penalty over individual sensing elements.

▶ **C-2 Computer Outputs**—All C-2 computer output signals are generated by the widely used 26-v., 400-cps. AY201-3-B Autosyn, made by Eclipse-Pioneer Division of Bendix Aviation. The 10 signals available from the computer are:

- **True airspeed** (linear scale factor), seven signals.
- **Mach number** (approximately linear scale factor), one signal.
- **Absolute (barometric) pressure** (logarithmic scale factor), two signals.

The true airspeed output signals are available in three different linear scale factors. Five of the TAS outputs have a scale factor of 36-deg. synchro rotation per 100 knots; the other two have scale factors of 360 deg./100 kt., and 69.09/100 kt. (60 deg./100 mph.). The barometric pressure scale factor is 3.6 deg./1,000 ft., based on a standard pressure-altitude relationship.

▶ **C-2 Accuracy**—Asked about the accuracy of its C-2 computer, H. F. Colvin, III, Kollsman project engineer, cited the following (for operation through a —55C to 70C temperature range):

- **True airspeed:** Less than 3% + 3 kt., with 90% of the errors less than 1.5% + 1.5 kt.
- **Mach number:** Less than 0.03M, with 90% of the errors less than 0.015 M.

The barometric pressure element in the C-2 is specifically designed for use with the P-1 combined airspeed indicator to make its Mach number error essentially independent of operating altitude. The result is that barometric pressure errors are larger at low altitudes than in a conventional Kollsman sensitive altimeter or than they will be in the MAD computer which will have an accurate barometric pressure signal suitable for general purpose use.

▶ **How It Works**—The C-2 is an electrical-mechanical computer operating from three signal inputs: static pressure, dynamic (pitot) pressure and measured outside temperature. An externally mounted USAF Type B-4 temperature bulb (developed by Lewis Engineering Corp.) provides the temperature signal input.

Pitot-static lines, connected to the front of the computer, are routed internally to static and differential pressure sensors. These are diaphragm movements, similar to those used in altimeters and airspeed indicators, each of which drives a small synchro instead of a pointer.

Three small servo systems convert the signals from the static and differential pressure synchros and the external temperature bulb into shaft rotations inside of the hermetically sealed computing mechanism which in turn drives the output synchros.

▶ **Servo Design**—The three servo systems use identical motors (two-phase, 400-cycle) and servo amplifiers. The latter employ two sub-miniature pentodes and are constructed in individual, hermetically sealed, plug-in type cases. The sub-min tubes have presented no reliability problems to date, Colvin says, although field experience is still quite limited.

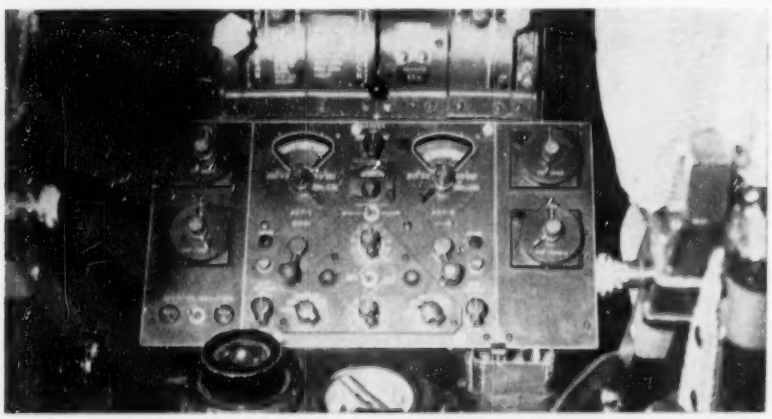
However, Kollsman recognizes the need for extreme reliability if the C-2 computer, and its successor, are to achieve wide acceptance. The company has already designed a servo system using half-wave magnetic amplifiers in the output stages for application to the MAD computer now under development. Magnetic amplifiers are potentially more rugged and reliable than tubes.

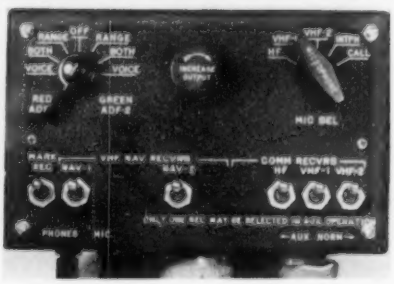
One version of this magnetic servo amplifier uses a junction transistor in the first stage; the other version uses a sub-min tube. Present transistor temperature limitations and lack of reliability make Kollsman reluctant to cast its lot with the transistor-mag-amplifier combination. However, the company is hopefully watching new transistor developments.

▶ **The Future**—Kollsman expects to deliver the MAD computer prototype to WADC early next year. In addition to providing density, temperature, and high-accuracy altitude signals, not now available in the C-2, the MAD computer will be designed to operate through a wider range of altitudes and airspeeds.

Despite its advantages, the master air data computer may have tough going in gaining industrywide acceptance. Major problem will be to standardize output signal scale factors, according to Jack Andresen, head of Kollsman's electrical-mechanical engineering department. Many equipments now in production or well along in development have been designed to use their own sensing elements whose scale factors have been selected for the convenience of the individual equipment. Some manufacturers will be reluctant to change scale factors when it involves even minor redesign.

From the standpoint of the aircraft manufacturer, the master data computer can save installation weight and trouble involved in running pitot-static lines to a variety of individual sensing elements. For this reason, aircraft manufacturers operating under the new USAF weapons systems management plan (AVIATION WEEK Aug. 17, p. 82) may see fit to exert pressures on sub-system suppliers to design their equipment to operate from a master data computer. Time will tell.



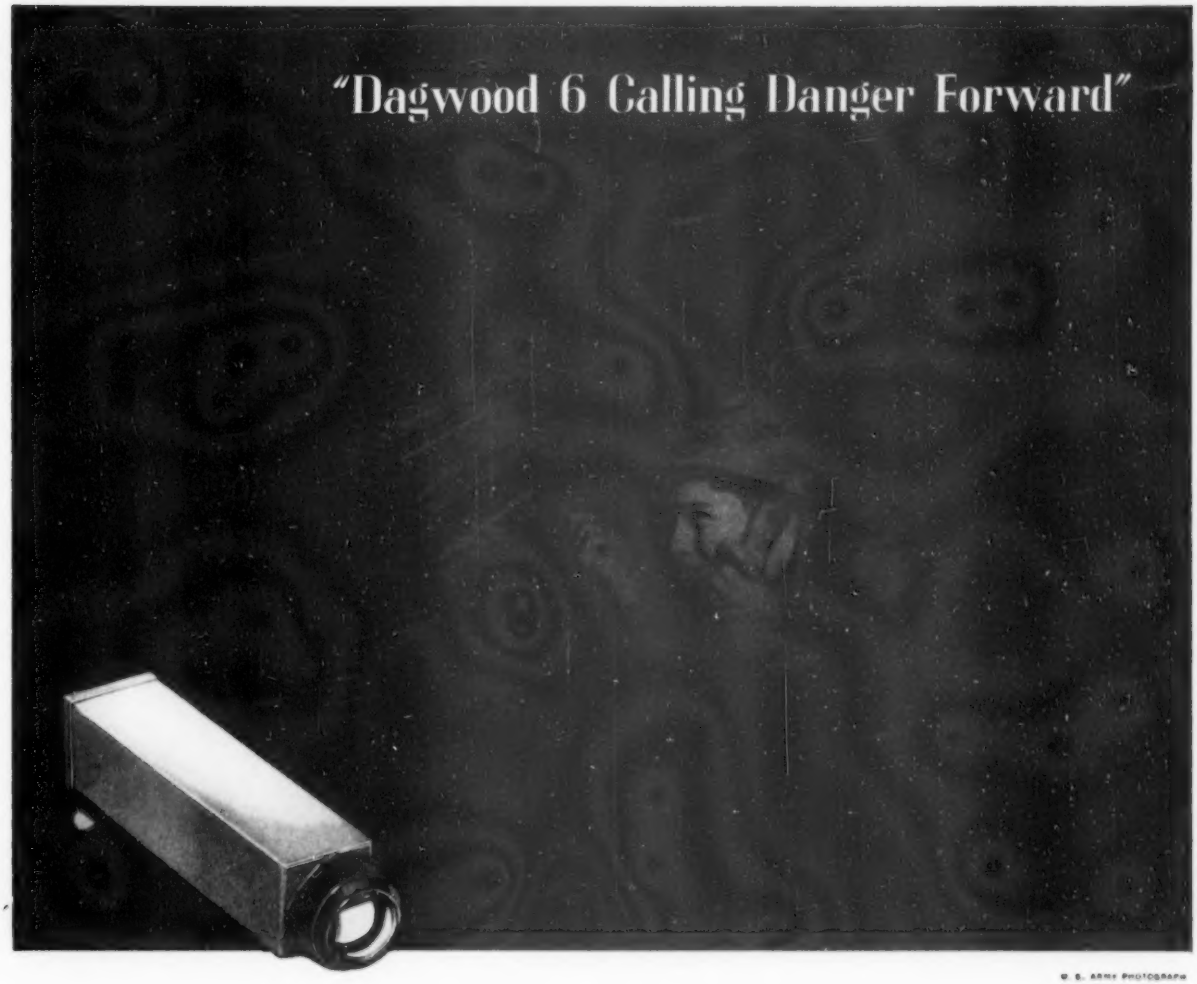


EAL'S STANDARD PANELS

Eastern Air Lines' flight crews will find this same radio control panel (above) and radio selector panel (right) in the cockpit whether they are flying 4-0-4s, L-1049 Constellations or DC-4s. The standardized panels, designed by EAL's electronic engineering department, are aimed at improving flight safety and reducing the number of different spares which must be stocked. The selector panel is used in EAL's L-749 Constellations.

Speedy Gyro Delivery

Summers Gyro Co., Santa Monica, Calif., can now deliver its Model 69 vertical gyros within 10 days of receipt of an order. Device has a roll-axis freedom of ±80 degrees, pitch axis freedom of ±60 deg., and gravity erection to within one deg. Summers says. Gyro weighs 3¼ lb., operates from 28 v.d.c. and has two 2,000 ohm potentiometer pick-offs.



U. S. ARMY PHOTOGRAPH

G.I. Joe now puts his calls through a new field switchboard twice the capacity and one-third the size of the one toted by his World War II counterpart.

The new "board" has a constitution that can winter in Rejkjavik, summer in Mombasa, and roll with a punch . . . just in case travel gets rough. Its retractable cords know when to come in out of the rain and goo.

Among the many essential parts of this instrument there is one named simply "SIGNAL. switchboard." It is a luminous-painted signal, operated by an electro-magnet, which "drops" into view when a line is calling. There's one "drop" for each telephone cord circuit; each drop is enclosed in a square housing made from Superior Hard Drawn Carbon Steel AISI C1008—.6815" I.D. Square, .020" wall, 2.656" long. Tolerances are close—±.005" on the length and +.007",—.000" on width.

Mr. Lloyd Bender, Vice President of The North Electric Manufacturing Company, makers of the switchboard, says of Superior, "Your performance has been excellent—in workmanship, quality of material and delivery."

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PITTSBURGH PLATE GLASS COMPANY

Runway Visibility Reporting Improved

- **Sperry tells its part in ANDB program.**
- **Tests show reduction in missed approaches.**

By George L. Christian

MacArthur Field, N. Y.—Sperry Gyroscope Co. has reached the one-third mark in its flight program testing a new system for telling pilots the precise ceiling/visibility conditions they may expect at destination (AVIATION WEEK Aug. 24, p. 48).

Called the "ANDB Low Ceiling/-Visibility Program," the project is sponsored by the Air Navigation Development Board, with U. S. Weather Bureau participation. ANDB started Sperry off with a $284,000 contract (to which $40,000 was recently added) to help the pilot meteorologically between the time he swings into his final approach and the time he touches down.

As Sperry spokesmen put it: "The project's goal is to let the pilot know precisely when he can transfer from instruments to visual reference and to describe as accurately as possible the meteorology of the situation as it exists at an airport at any given time."

► **Right Approach**—Used in the new program are a new, continuous-reading ceilometer and a transmissometer; respectively they tell the height of the cloud base and the brightness of the atmosphere at the threshold of the instrument runway.

Tried experimentally in conjunction with improved end-of-the-runway weather reporting techniques at Washington National Airport, these devices have reduced missed approaches from 8% to 3% in the past year, according to CAA officials. Approaches were made with visibility of less than one mile.

The only other existing installation is here at MacArthur Field, Sayville, L. I., where Sperry maintains its experimental flight facilities. But 15 additional sets are on order, of which three will be installed at LaGuardia, Newark and Idlewild fields in the New York area, and the remaining 12 at other critical airports in the U. S.

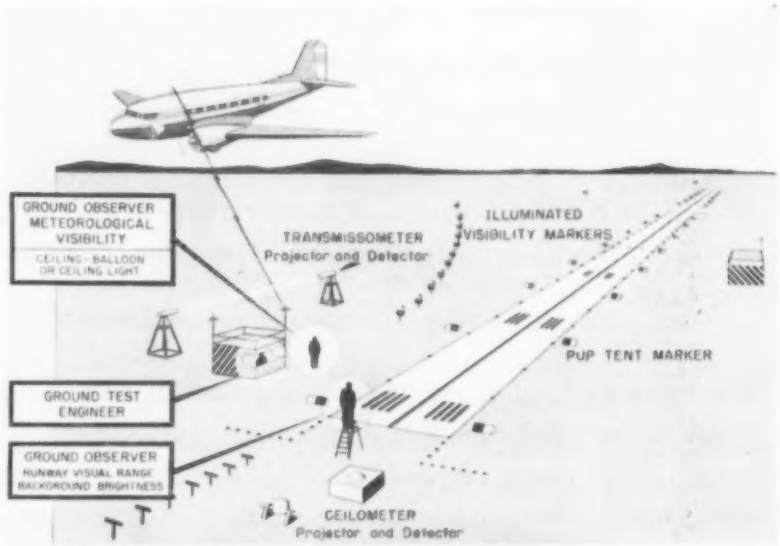
Many agencies are interested in the low ceiling/visibility program, in addition to ANDB (representing all branches of the military services) and the Weather Bureau. The Civil Aeronautics Administration, Civil Aeronautics Board and the airlines all are following this work closely.

When put into operation, this Sperry system could not only boost landing safety, it could make approaches under bad weather conditions more efficient, permitting planes to land at shorter intervals.

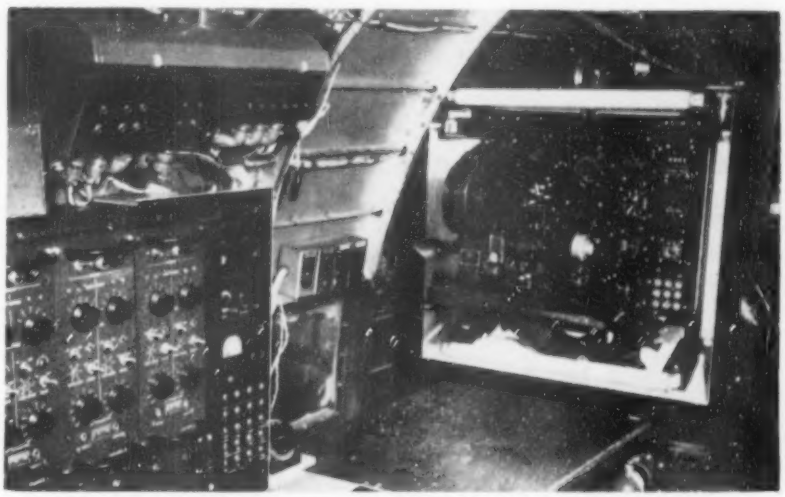
► **Significant Differences**—Giving impetus to the low ceiling/visibility program was the knowledge that significant differences exist between ceiling and visibility reported to arriving pilots by the tower and actual conditions as they exist during final approach and at the runway threshold (usually half a mile from the control tower—often much farther).

Moreover, under prevailing methods of weather reporting, considerable time may elapse between the moment a weather reading is taken and the time a pilot is given the report.

So instruments were developed and a system devised whereby a pilot would be furnished with almost-continuous,



SPERRY USES DC-3 to test improved weather reporting techniques.



INTERIOR VIEW of plane shows movie camera and other recording equipment.

REPORT TO OUR ADVERTISERS . . .

Eight months of progress climaxed by the biggest issue and the biggest month in AVIATION WEEK history . . . a record 427.57 advertising pages for August 1953.

***AVIATION WEEK** believes that its advertisers—an audience that continues to grow substantially with each passing month—are due a progress report on their favorite magazine.*

We have *just published a record 454 page issue, the August 17 edition, as well as the biggest advertising month in Aeronautical publishing history. The August advertising figure, 427.57 pages, as well as AVIATION WEEK's eight months 1953 total of 2,344 advertising pages represents more space than the combined total of the next three* Aviation publications. *With this whopping total AVIATION WEEK for the second year heads for that select group of young and old pros comprising the 25 largest consumer and business magazines in the nation. Heady stuff!*

This solid achievement *of AVIATION WEEK is further spelled out by its uninterrupted progress to record industry acceptance and advertising volume, a fact convincingly illustrated by its yearly advertising figures: 1950—1,680.92 pages, 1951—2,541.95 pages, 1952—3,248.07 pages, 1953—3,425 estimated pages. With volume such as this, it becomes futile to speak of rate of growth comparisons. From 50 to 100 pages monthly represents a 100% gain, but the net result is something less than substantial in terms of industry potential. In publishing perspective, a gain from 225 to 250 advertising pages a month—a 7.7% gain—which on first inspection does not sound so impressive, is far more to be desired. Experienced buyers of magazine advertising space happily are in the know as far as Aviation space is concerned. They pay little, if any attention, to such percentage comparisons. Long ago they marked them as deceptive and unreliable unless such claims were advanced where equal or near equal advertising volume was involved. In the Aeronautical field the advertising leadership of AVIATION WEEK has been unchallenged and uninterrupted for many years . . . year after year this publication has published more than the combined total of the next three publications.*

Advertising figures *such as these, however, tell only a partial story of AVIATION WEEK*

progress. Along with them go the expansion of our editorial services, with a staff now numbering 18 full-time editors, skilled Engineering and News specialists recognized throughout the industry. In the last eight months, in addition to their regular AVIATION WEEK writings, products of their talent have appeared in the SATURDAY EVENING POST, READERS DIGEST, HARPERS Magazine and on Major National Television Channels. Their achievements are ones in which we take considerable pride. They are an indication of the caliber of our staff. Supplementing their services are eight domestic News Bureaus, the services of Press, Inc., subsidiary of the Associated Press, Inc., foreign news offices in London, Paris, Frankfurt, Manila, Mexico City, Sao Paulo and Tokyo, and correspondents in the principal cities of the world.

***This heavy concentration** of editorial talent and resources has resulted in the building of a reader preference unique in the business publication field. It is a record that has been exhaustively tested by the industry itself through their own reader preference studies. Of twenty-seven conducted through engineering and management departments, customer lists and directories AVIATION WEEK has won them all — and not closely but by a better than 4 to 1 average. It is our standing offer to any manufacturer to conduct his own reader preference study, if he wants to get at the facts of reader preference and magazine pulling power. We'll gladly pick up the check, if he desires. This record of reader preference has stood for years, increasing in momentum, and explains why when orders and inquiries of merit are wanted, AVIATION WEEK is always first at bat.*

***Our growing audience** of AVIATION WEEK paid subscribers ($6.00 per year) continues to rise significantly. There are 10,000 more on the books since last year, making up a current total of over 45,000 net paid subscribers, (42,743, 6/30/53 ABC statement). Likewise our book-value rises importantly as indicated by our all-time high renewal percentage.*

***These facts** and figures should serve in some small measure to make clear AVIATION WEEK's position among the powerful, independent publications of today. They are furnished to you with a deep sense of gratification because through you we were able to achieve them.*

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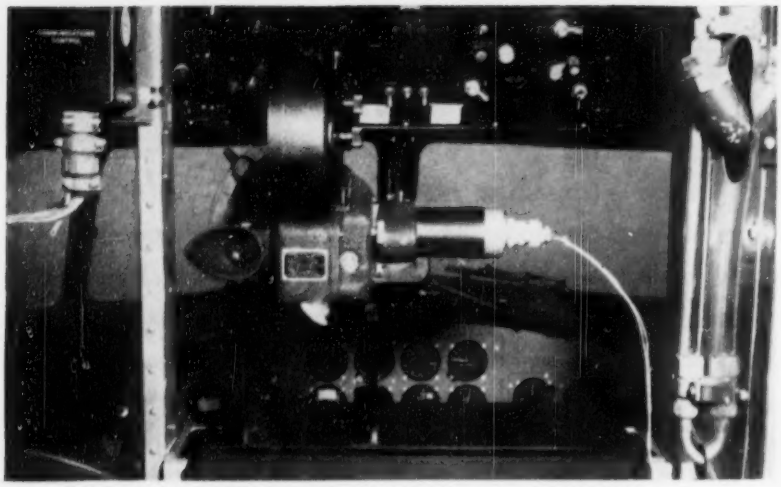

COCKPIT MOVIE CAMERA records pilot's-eye view of approach visibility.

GROUND STATION remotely records weather readings and synchronizes them on tape recording with flight crew's observations on actual visibility conditions.

up-to-the-minute information on the meteorology at the airport.

Now, with the program still in its infancy, continuous ceiling readings allow experienced weather observers to deduce cloud base contours with high precision: they can predict to a pilot almost exactly when he will break out of the overcast as long as seven to eight minutes in advance of the critical moment when he has to decide whether to land, go around, or proceed to an alternate.

CAA observers estimate that with the advent of commercial jet aircraft, the time prediction element may have to be increased to as much as 20 minutes.

Old-style ceilometers gave a reading every six to 12 minutes. But ceiling variations of 300-400 ft. in 12 seconds have been recorded, so ceilometer readings often were unreliable.

▶ **The Tests**—Sperry has assembled an elaborate array on the ground and in the air to integrate the answers to such questions as:

- When did the flight crew first see the ground vertically below?
- Did they see the approach lights, and when?
- When did they see the threshold of the runway?
- Where along the approach path was the plane at these times?

▶ **On the Ground**—Here is the ground setup:

On the left side of the threshold of the instrument runway works a team of three men: a ground observer for meteorological visibility, who determines ceiling height or light (using balloons), a ground observer for runway visual range and background brightness, and a ground test engineer who works in a Weather Bureau station established at the end of the runway and collates the observations of the two ground observers with instrument readings of his own. He is given ceiling data by the ceilometer every 12 seconds. He is furnished accurate indications of brightness or visibility by the transmissometer, and an anemometer and vane give him wind velocity and direction.

All this information is transmitted to the tower at frequent intervals for re-transmission to pilots in the vicinity.

Here are the tools these men have to work with.

- **Ceilometer.** This new version of the machine used to measure ceiling has two basic advantages over previous models: The projector rotates through 360 deg. (on a horizontal axis) every 12 sec., giving an almost continuous indication of height of cloud base; and it may be read remotely.

The ceilometer's projector and a detector are two hundred feet apart. The projector throws a 240-watt beam of light to the cloud base. A rotating barrel-type shutter modulates, or interrupts, the light beam 150 times a second to distinguish it from aircraft, airport and other lights. Later models of the projector will have two lights, back-to-back, resulting in a reading being taken once every six seconds.

The detector consists of a square box about five feet on a side. In the center, facing up, is a highly polished, parabolic reflector protected from the elements by a heavy piece of glass. Modulated light rays from the projector, reflected from the cloud base, are caught by this reflector, fed to a photo-electric cell, then to an automatic device which instantaneously calculates the angle formed by the projected light beam on the cloud base. The angle is read from an indicator located in the ground test engineer's shack at the end of the runway. By consulting a set of tables, the engineer may rapidly convert the ceilometer angle to a specific height which he communicates to the tower.

Current tests at MacArthur Field use two ceilometers. First is placed 1,400 ft. from the threshold of the instrument runway, second at the middle marker, 3,700 ft. from the end of the runway. Sperry technicians are currently evaluating the best location for the ceilometer.

- **Transmissometer.** This instrument, developed by the Bureau of Standards, is also made up of a projector and a detector. The two units are located 750 ft. apart at the instrument runway threshold and are parallel to the runway. Projector shines a beam of light on a photo-electric cell in the detector. Intensity of the light beam is shown on an indicator in the ground station on an instrument scale calibrated from 0 to 100 to indicate visibility along the runway. Transmissometers cost about $3,000, ceilometers about $7,000. Total cost, including installation, runs about $12,000.
- **Visibility markers.** A series of visibility markers extend along the field in an arc from the ground station. The size of the 11 rectangular, black markers

becomes gradually larger with increasing distance from the observer. This gives the illusion that they are all the same size and results in their subtending the same angle from the observer's eye. Each marker is illuminated by a 25-w. bulb for nightwork.

• **Pup tent markers.** Black-and-white pup tent markers are spaced on both edges of the runway along its entire length. With the standard, parallel-line distance indicators painted at intervals along the runway, these give check points along the runway with which to gauge visibility to the ground observer for runway visual range.

This observer stands on a removable ladder and takes a reading each time a plane lands. The ladder raises the height of his observation to approximately that of the pilot's eye level.

Also measured are wind direction and velocity; and sky brightness is measured by a photometer.

All conversations between ground station and aircraft pilot are tape-recorded.

▶ **In the Air**—Sperry has equipped a DC-3 with various instruments and cameras to check "brightness data, which in conjunction with actual object brightness measurements, will serve as a basis for the determination of mean slant transmissivity of the atmosphere between the aircraft and the ground."

The five-man crew includes pilot, co-pilot, instrumentation engineer (for visible terrain and cockpit movie cameras), instrumentation engineer (for photo panel and graphic recorders) and a flight test engineer.

These are the cameras and instruments provided the flight test crew:

• **Visible terrain camera.** Really two units in one, the visible terrain camera is mounted in a blister protruding from the left side of the DC-3's fuselage just below the pilot's side window. It is accessible from inside the aircraft.

The camera has but one shutter and film, but is equipped with two lenses. Main lens is 80-deg. wide-angle unit. It is aligned to photograph from 10 deg. above the horizontal to 20 deg. from dead vertical, and from 10 deg. to the right of the nose of the aircraft to 70 deg. to the left. Purpose of the camera is to photograph as much of the terrain which the plane is approaching as possible.

Special filters matched to the film give it the same spectral sensitivity as the average human eye.

Inside the camera is a second lens focused on an illuminated "grey scale" showing all gradations of grey from white to black. The grey scale is simultaneously recorded on each exposure of the visible terrain camera to give comparisons of standard grey with the greys of the terrain being photographed. It also serves to correlate density of silver deposits of the photographic film to

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made from

stress-relieved Teflon*

■ A unique method of processing Teflon resin relieves internal strains without inducing porosity in "Fluoroflex-T" products—thereby producing maximum dimensional stability and tensile strength.

Starting with virgin, unreprocessed Teflon powder, all manufacturing operations are under a strict quality control and inspection system approved by the USAF under MIL-Q-5923 specification. This assures production of Fluoroflex-T products which are in conformance with AMS-3651.

When you back up "O" ring seals with these Fluoroflex-T anti-extrusion rings, you can be sure of optimum performance and maximum operating life, even in larger sizes.

WORKING ADVANTAGES OF FLUOROFLEX-T BACK UP RINGS

1. They withstand up to 500°F without decomposition
2. They are chemically inert in acids, alkalies, solvents, and natural or synthetic oils
3. Self-lubricating, they reduce friction and abrasion on the "O" ring
4. Non-fraying, they cannot cause malfunctioning of other components in the system
5. Their spiral construction simplifies installation

Fluoroflex-T spiral rings are designed in a complete range of sizes for use with AN6227 and AN6230 series "O" rings. Write for Bulletin FR-1.

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New, Sensitive
SHUTTLE VALVES
With dead-tight sealing from 1 to 3000 psi.

A CIRCLE SEAL Precision Valve

DESIGNED to provide automatic switch-over from either of two control stations, allowing for control from each. Also ideally suited for use as "breakaway" valves to switch over automatically from a normal source of pressure to an emergency source. For virtually any type service from very low pressure instrumentation circuits to high pressure pneumatic or hydraulic circuits (where no detent is required). They are offered for liquid flow rates up to 5 gallons per minute and for gas flows to 20 CFM.

FEATURES: Extremely sensitive shuttling action with dead-tight sealing at pressure differentials of from 1 to 3000 psi. This exceptional sealing efficiency is achieved by our patented "Circle-Seal" principle which makes use of a free floating "O" Ring as a sealing member between two conical metal seats of a poppet type valve. Shuttling pressure differential is but a few inches of water.

CONSTRUCTION: Normally furnished in aluminum with ¼", ⅜", ½" or ¾" tube connections, or in brass with ⅛" or ¼" female pipe connections. Other materials can be supplied to special order.

DESIGNATION — Series 400.

SOURCE: JAMES-POND-CLARK—2181 East Foothill Blvd., Pasadena 8, California. Engineering data on request.

the grey scale and thus eliminate variables which may occur during film development. In other words, the grey scale permits measuring absolute instead of relative brightness.

This still camera, triggered by an intervalometer, takes pictures at two-second intervals during an approach. It usually takes an average of 40 shots during one run. The impulses which trigger the visible terrain camera also serve to synchronize all other events and observations in the air, and by radio impulse, the airborne observations are timed to all ground events and observations.

The camera is also equipped with an independent photometer which measures average brightness in a 15-deg. circular field ahead of and on the same axis as the lens. Located just above the camera, the photometer serves as an independent check of the unit's operation.

• **Cockpit movie camera.** This 35-mm. unit, mounted between pilot and co-pilot, makes a continuous photographic recording of approximately what the two pilots see through the windshield. It is also provided with a photometer which records brightness in a 15-deg. cone centered on the axis of the movie camera's lens.

• **Photo panel recording camera.** Located in the forward part of the main cabin, this movie camera records such standard readings as airspeed, altitude, localizer and glidepath indications, clock, outside air temperature, and indications from a cloud detector mounted outside the airplane. Device measures moisture content of the air through which the plane is flying.

In the lower right-hand corner of the panel are nine small lights which act as special events indicators.

Recorders next to this camera make a permanent record of such events as the plane's roll and pitch, brightness meter readings, etc.

▶ **"Sperry Weather"**—To date, Sperry crews, searching out foul or "Sperry weather," have operated over 150 flights through ceilings of 800 ft. or lower.

They hope to conduct 500 such flights before the final findings are turned in to ANDB and the CAA.

Load-Dumping Valve Aids Crop Dusters

Crop-dusting planes may find it easier to get out of blind canyons and other tight spots with a new dump valve for jettisoning spray loads.

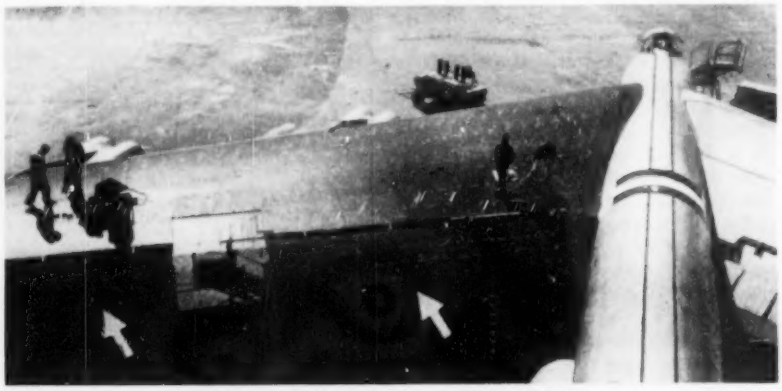
Originally designed for timber-spraying work by Central Aircraft, Inc., the valve reportedly has been installed and used with success in aircraft spraying of all kinds of crops.

Body of the unit is an aluminum casting with a 5-in. inside diameter. It is instant-opening and leak-proof and will dump approximately 80% of a fully loaded 160-gal. tank in 5 to 6 seconds.

The lid is made of cast aluminum and is held in place by an over-center clamp which is designed to withstand 700-lb. pressures from within. For release, a 3-lb. pull on the clamp arm flips the valve to wide-open position.

The unit can be mounted on any surface having a flat circular area of 6⅝ in. or more.

Central Aircraft, Inc., Box 1364, Yakima, Wash.



B-52 UNDERGOES FLOW TESTS

Left wing on huge Boeing B-52 Stratofortress is painted black to provide effective contrast with white nylon strips used during flight tests to check airflow characteristics. Conventional yarn tufts previously used were too small for effective photographing from camera station 48 ft. up on bomber's fin, hence switch was made to ¾-in.-wide strips against black background. Also, instead of the single camera formerly used, two were installed for the tests. Arrows indicate trailing edges of extended inboard and outboard flap segments. Men at left are working in region of spoilers normally used for lateral control. Aileron seen on wing trailing edge between flap segments probably is for lateral control system feel or for use by autopilot system.

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AIRCRAFT MOTORS

These highly specialized aircraft motors are engineered for the particular duties established in components where locally applied positive action power is necessary. U. S. Motors is one of the pioneers of high frequency induction type aircraft motors and has accrued experience in research, testing and applications second to none.

Features:

ALTERNATING CURRENT—
3-PHASE, HIGH FREQUENCY
1/20 TO 16 H.P. 400 CYCLES
UP TO 23,000 RPM
INTERMITTENT & CONTINUOUS DUTY
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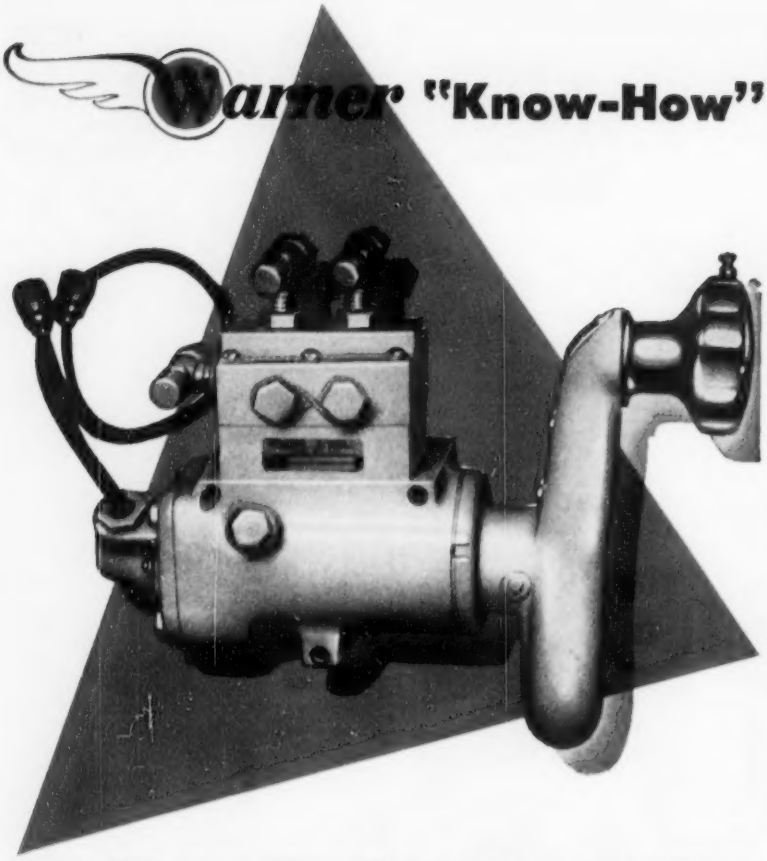

The "Know-How" to Mass Produce Precision Hydraulic Equipment

The hand pump shown above is a typical example of Warner's ability to mass produce precision hydraulic equipment. This pump is used in connection with a special ordnance application requiring high volumetric efficiencies and must be produced to very close tolerances.

Warner is qualified by experience and facilities for the design and production of hydraulic equipment for a wide range of uses.

Warner engineers will welcome an opportunity to assist you in the development of special hydraulic equipment to meet your particular requirements.

Send for your copy of an illustrated folder describing typical examples of Warner Hydraulic Equipment.

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DESIGNERS AND MANUFACTURERS OF PUMPS • VALVES • ACTUATORS

OFF THE LINE

New berthable seat, developed by Hardman Tool and Engineering Co., will be used in lounges of Air India Super Constellations and aft cabins of Qantas' Super Connies, Hardman says.

Utility travel kit for airline passengers, called the Sky Guest Pac, is being offered as a promotional device for airlines. Kit contains a number of top-brand items useful for the passengers' personal grooming and convenience. Products include shaving cream, blades, toothbrush, comb, toothpaste, cosmetics, etc. Trans World Airlines distributes the kits on its coast-to-coast run, and negotiations with other carriers are underway. Most of the cost is borne by the manufacturers of the individual items contained in the kit, with the result that the unit can be offered to carriers for the nominal price of boxing, printing, handling, says Guest Pac Corp., 17 E. 42 St., New York, N. Y.

Port of New York Authority's Bell helicopters just can't do without that TCP, Shell's anti-plug-fouling additive. The pilots carry little canvas bags with vials in two sizes of TCP. One size vial is just right for 5 gal. of fuel, the other for 20 gal. So if the pilot has to fuel at some location where the additive is not available, he just adds his own.

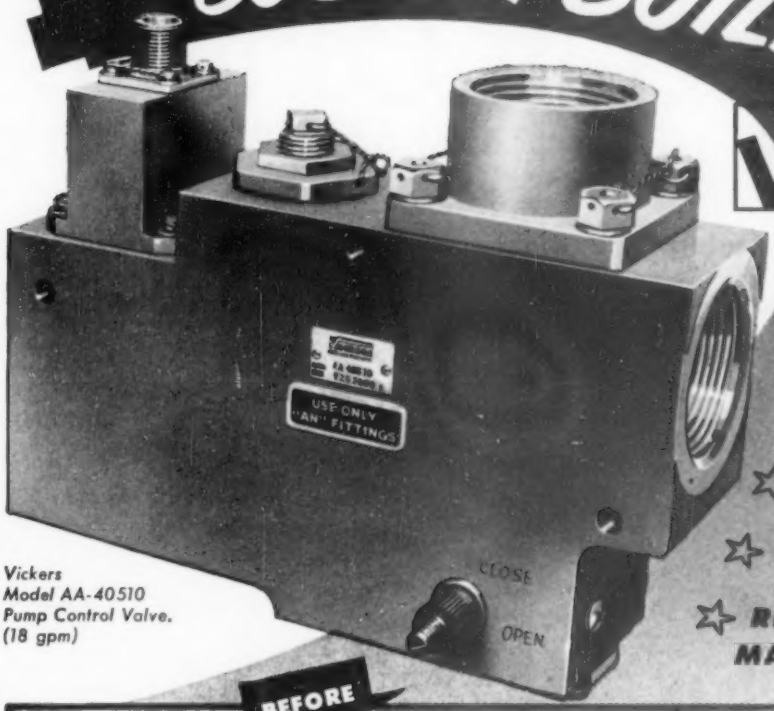
A 65% reduction in delays due to ignition trouble is credited by El Al Israel Airlines to use of Scintilla ignition analyzers. El Al uses the airborne unit as a permanent installation in its three Constellations.

Printed pressure-sensitive tape is finding wide aircraft usage, not only for fluid line identification, but on all wiring and hose assemblies, its maker says. The Vinyl tape is inert to most solvents, according to the manufacturer. Printed Cellophane Tape Co., 521 No. La Brea Ave., Los Angeles.

Seat Investment

Cost of constantly modernizing an airline fleet is pointed out by Delta-C&S Air Lines, which calculates that each of the 69 passenger seats in new Douglas DC-7s on order represents an investment of $26,100. In 1941, the carrier's DC-3 equipment represented a capital investment of approximately $5,700 per seat. Each seat in its new Convair 340s represents an outlay of $13,650, Delta says.

CUSTOM-BUILT



Vickers
Model AA-40510
Pump Control Valve.
(18 gpm)

VICKERS VALVE...

- ☆ SIMPLIFIES HYDRAULIC SYSTEM
- ☆ REDUCES FIRST COST
- ☆ SAVES WEIGHT
- ☆ REDUCES MAINTENANCE COST

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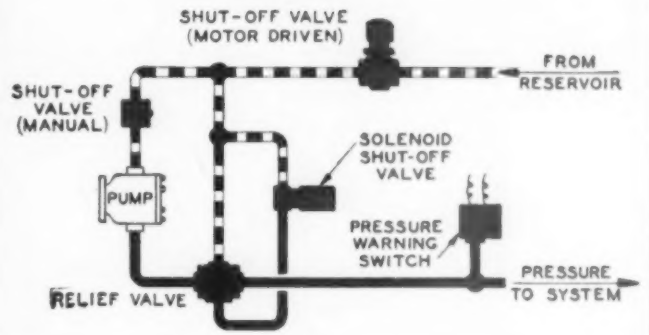

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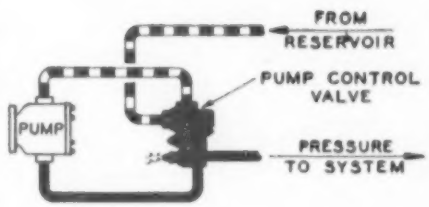

Special Vickers Pump Control Valve replaces five separate units.

This special 5-in-1 valve was developed for use where it is desirable to individually control each of several pumps. It will automatically unload the pump delivery at a low pressure into the suction side when the oil temperature has reached a predetermined maximum. The design includes manual unloading of the pump. Maximum system pressure is limited by a built-in relief valve. A pressure-actuated electric switch is provided for use in a signal system to flag system pressure changes. The manual pump shut-off control also serves as a firewall shut-off device.

As used on one four-engine airplane, this accessory reduced the number of separate hydraulic units from 14 to 4 and eliminated four electrical switches. It utilizes many standard internal parts. Replacement of multiple accessories by the single valve reduced procurement costs by about 66%; this does not include savings due to the simplified piping. The weight saving was also significant. For further information, write for new Bulletin A5230.

Vickers designs and manufactures a great variety of special hydraulic controls for aircraft. Call on us with your problem.

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completely integrated, highly sensitive remote positioning systems for a wide variety of controls needed throughout today's aircraft

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Servo Controls and Computers
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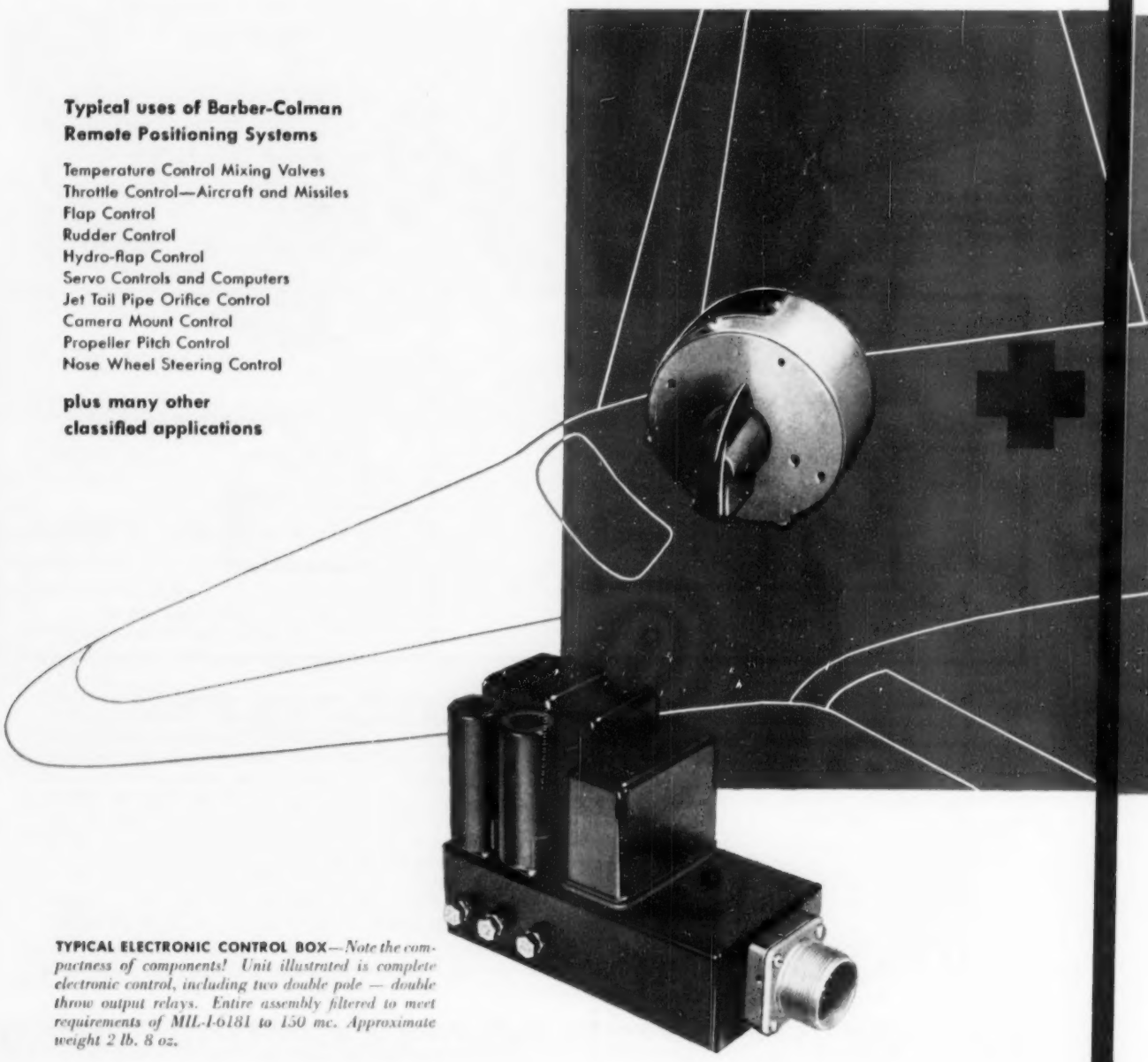
plus many other classified applications



TYPICAL ELECTRONIC CONTROL BOX—*Note the compactness of components! Unit illustrated is complete electronic control, including two double pole — double throw output relays. Entire assembly filtered to meet requirements of MIL-I-6181 to 150 mc. Approximate weight 2 lb. 8 oz.*

To meet the constantly growing need for remote control of various components on today's complex aircraft and missiles, Barber-Colman Company now makes three types of positioning systems.

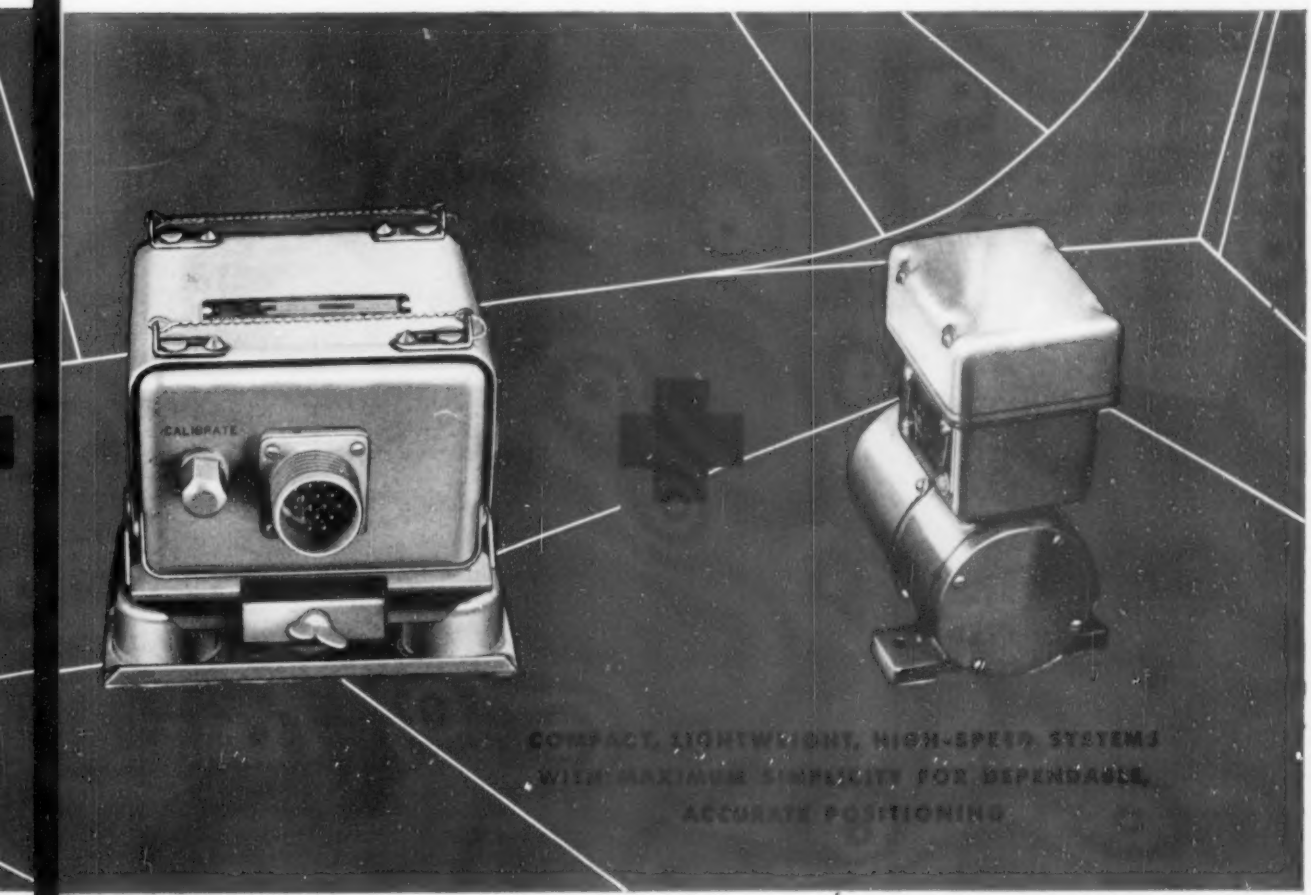
Each is a *complete* system. Listed below in order of increasing accuracy, outstanding features of each are as follows:

BASIC REMOTE POSITIONING—Ideal for moderate speed control applications. Basically a d-c bridge with transmitting and receiving rheostats. Actuator is energized by null-seeking polarized relay which detects unbalance signal. Simplicity and ruggedness are important features for long life and ease of maintenance.

HIGH-SPEED POSITIONING—Utilizes a unique velocity feedback circuit directly to coil of ultra-sensitive polarized relay. Simple adjustment of amount of feedback permits actuator speeds up to 90° per second, with any degree of damping. Overtravel or hunting may be completely eliminated.

ELECTRONIC HIGH-SPEED POSITIONING—For applications requiring the utmost in position accuracy at any speeds. Extensive circuit research has produced an extremely simple, lightweight control resulting in maximum performance. Available for operation with either low or high impedance, a-c or d-c inputs.

Whenever you have a need for remote positioning controls, consult Barber-Colman engineers for the system best suited to your application. Send coupon below for details.



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solving the
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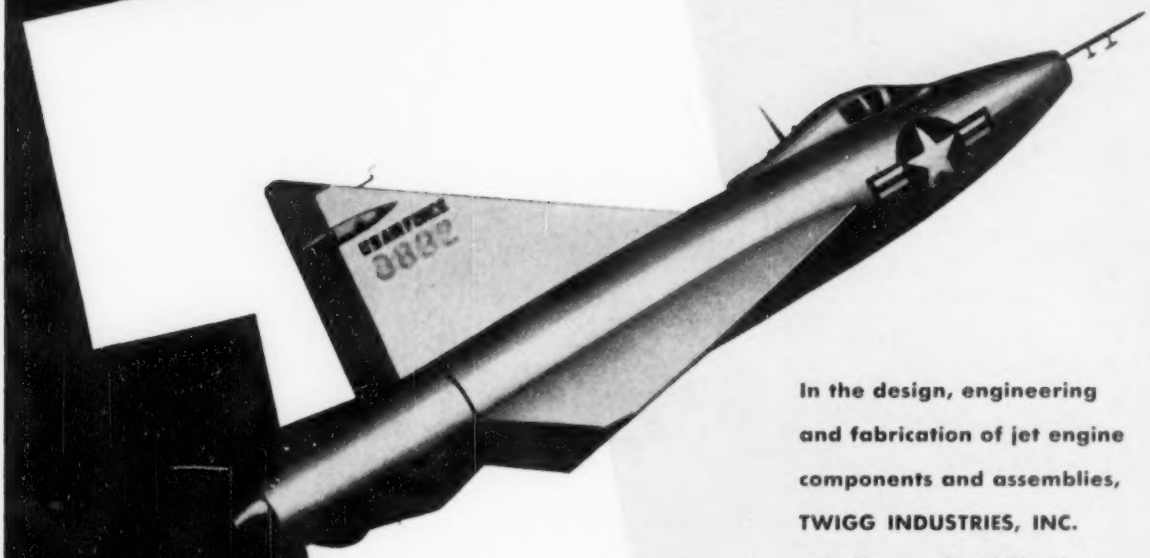

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transition liners
turbine casings
tail cones
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all type spinnings
tube bending
other essential components

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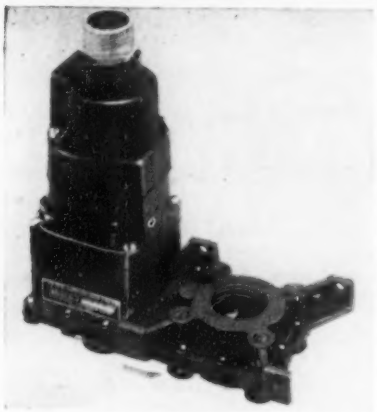


B-47 Shut-Off Valve In Mass Production

A new 1¼-in. motor-operated fuel shut-off valve for the Boeing B-47 has been put into mass production.

Developed by Standard-Thomson Corp., the unit will be manufactured at the company's Dayton plants until November, when production will be shifted to a new plant near Vandalia, Ohio.

Outstanding feature of the valve, according to Standard-Thomson, is a cam-operated mechanism which retracts the seal rings from the valve gate just before gate is set in motion. Rings remain retracted until gate is returned to closed position. Both rings are lipped with soft, synthetic rubber.

An over-ride mechanism in the actuator, which provides positive positioning of the gate, is another improvement cited by the company. It disengages the actuator from the gate in full-open or full-closed position, at the same time providing for prompt re-engagement.

The number of valves installed throughout the fuel system of each bomber will vary from 32 to 36, depending on the model. Each of these will be able to carry a load of up to 2,000 gallons of fuel per hour in either direction at outlet pressures as high as 60 psi. and will be required to operate satisfactorily at minus 65F to +160F ambient temperatures.

Motor for the unit is a simple permanent-magnet type powering a unidirectional, planetary gear actuator.

Standard-Thomson Corp., 216 South Main St., Dayton 2.

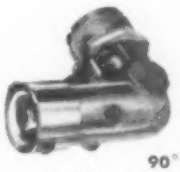
Insulating Polymer Raises Electron Tube's Altitude

By using Kel-F polymer as the socket insulation and extending the insulating barriers on the socket base, an electron

Everything's Under Control with DRIVES and TRANSMISSIONS by BREEZE MARK

90° ACTUATOR DRIVE
For direct connection to actuator that pivots in trunion mounting

TORQUE TUBE DRIVE
For transmitting torque between torque tube and flexible shaft



90° DRIVE
Precision gearing, double ball bearing suspension
Sealed and lubricated

TEE DRIVE
Precision geared for actuators connected in series

■ To actuate tabs, flaps, shutters and other aircraft mechanisms with positive, precision control, the industry long has relied on Breeze drives and transmissions. From simple mechanical drives and direct reading indicator drives to electrical and hydraulic actuators, Breeze offers a complete line, affording a wide choice of components and assemblies to meet many individual design needs.

Shown here are examples of Breeze-engineered lightweight mechanical drives, having connections to mate with flexible shaft drives. The 90° and TEE drives may be mounted in any position with relation to an actuator mounting.

Inherent in all these designs are features dictated by specific aircraft needs and experience. You may find the assemblies you require in our wide variety, thus saving design and tooling costs. Or, our engineers will design and custom build to your special requirements.

We invite consultation. Write for our complete informative catalog.

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If you use relays—Clare's New Plant is

CLARE RELAYS are now built in the most modern plant ever specifically designed for relay manufacture

Light eight times better than average for industrial plants —75 foot candles of shadow-proof light at bench level.

All air electrostatically washed —avoids danger of contamination in such operations as contact welding.

100% inspection of all Clare relays with most modern test equipment. Light on this test set gives 125 foot candles.

• Building of precision relays requires more than technical skill. It requires an atmosphere of utmost freedom from dirt. Air temperature and humidity must be closely controlled. Assembly of small parts must be done under powerful, yet shadow-free light.

All these important features and many more are provided in the new Clare relay plant. Never before have so many manufacturing advantages been provided in one plant—for one purpose—to give you relays of unequalled quality.

Quality and long-life dependability of Clare relays have made them first choice of designers as components for critical equipment. Wherever failure cannot be tolerated, when only the best is good enough, Clare relays are indicated.

Two important factors contribute to this Clare superiority. Production of relays has always been the exclusive business of

***FIRST* IN THE INDUSTRIAL FIELD**

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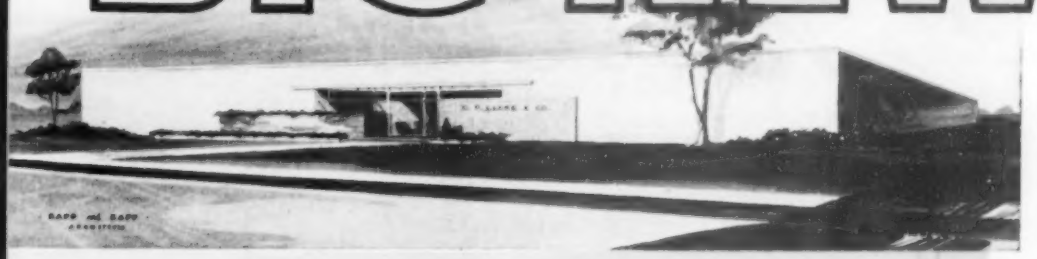

C. P. Clare & Co. This is a young-minded progressive organization, ever alert to discover and test new and better materials and manufacturing methods.

The new plant is the product of years of research and experiment. It is the natural development of Clare's unwillingness to offer their customers anything less than the most perfect relays that can be built.

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If yours is a product whose long life, reliable performance and freedom from maintenance depend on the use of relays—it will pay you to know ALL about Clare relays. A sales representative, fully experienced in every type of relay problem, is located near you. Consult him, or write C. P. Clare & Co., 4719 West Sunnyside Avenue, Chicago 30, Illinois. In Canada: Canadian Line Materials, Ltd., Toronto 13. Cable Address: CLARELAY.

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WITH a Socony-Vacuum credit card in your wallet, and Flying Red Horse aviation products in your plane, you're sure of friendly credit—top-flight performance *wherever* you fly.

Socony-Vacuum credit cards are honored at hundreds of airports here and abroad . . . can be used for all Flying Red Horse aviation products. Always land at the Sign of Friendly Service!

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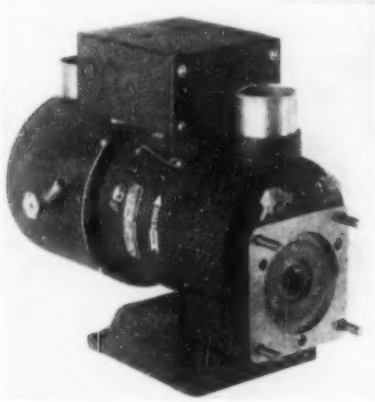
The Best Pair to Get You There!

tube's altitude ceiling was raised 15%, reports M. W. Kellogg Co., producer of the plastic.

The company attributes this mainly to the high dielectric strength of Kel-F (trifluorochloroethylene) which prevented ionization and arc-over which formerly ruled out use of the tube at higher altitudes. High mechanical strength of the plastic enables the electron tube barriers to be made thin, yet capable of withstanding heavy shocks and vibration. The tube socket is injection molded by the Elco Corp., Philadelphia.

M. W. Kellogg Co., Jersey City, N. J.



New Hydraulic Pump Motor Developed for Jet Bombers

General Electric Co. has come up with a new air-cooled 3½-hp. hydraulic pump motor for jet bombers.

Developed by the company's specialty motor sub-division, the unit is rated at 7,500 rpm. Functions are to supply hydraulic power for control of the aircraft's tail assembly, and in the wing serve as a standby source of power where the jet is the primary source.

The motor is of the ducted type, employing an air-through design which utilizes a built-in blower to draw ambient air from outside the plane, circulate it through the brushes and windings, and expel it from the pulley-end stack.

According to GE engineers, the air-through design is much more effective than the old air-over arrangement because it allows air to be brought directly to the primary sources of heat, the armature and commutator.

GE lists as important features of the motor: it can circulate air from minus 65 to plus 135F at altitudes approaching 50,000 ft., it is explosion-resistant through the use of two blower tubes connecting via ducts to the outside air; it has a three-to-one gear reduction; it is equipped with a radio noise filter; condensate tubes on its side draw moisture out of the motor.

General Electric Co., Schenectady 5.

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Miniature HF Alternator Delivers Lots of Power

Lots of power in a small package is provided in tiny 22-oz. high-frequency alternator. It delivers 350 watts at 5,000 c. with the shaft turning at 25,000 rpm. It is one of a line of miniaturized units with ratings from 125 to 4,000 watts and speeds to 50,000 rpm. Unit shown is Model 17, measuring only 2¼ in. in diameter.

D&R, Ltd., 402 E. Gutierrez St., Santa Barbara, Calif.

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Better protection against fuel-fed fires is provided by automatic shutoff valve which operates like sprinkler head in reverse and can be used in aircraft test stands, gasoline supply lines and other equipment. Normally open, it closes instantly when high temperature triggers the actuating head that releases shutoff spring. Valve also closes to prevent secondary explosions if head is knocked off by blast.—Valco, Inc., 1410 West St., Cincinnati 15.

Laminated plastic ball bearing retainers developed by Synthane reduce weight, friction and galling in super-precision aircraft bearing assemblies, permit smooth, rapid acceleration to speeds exceeding 100,000 rpm. in instrument, turbine and supercharger blower applications. Tests show vibration is less than with metal. Retainers are self-lubricating and machined to close tolerances (plus 0.005 to 0.001 in.) Smallest produced so far: six-ball type, with 3/64-in. pockets measuring .100 in. i.d. and .143 o.d., for an aircraft instrument.—Synthane Corp., Oaks, Pa.

Harness reel gives protection in case of severe or crash landings. Attached to pilot's shoulder harness and more than meeting military specifications covering MA-2 reels, the Sturgess Harness Reel has a 14-in. cable, and locks auto-

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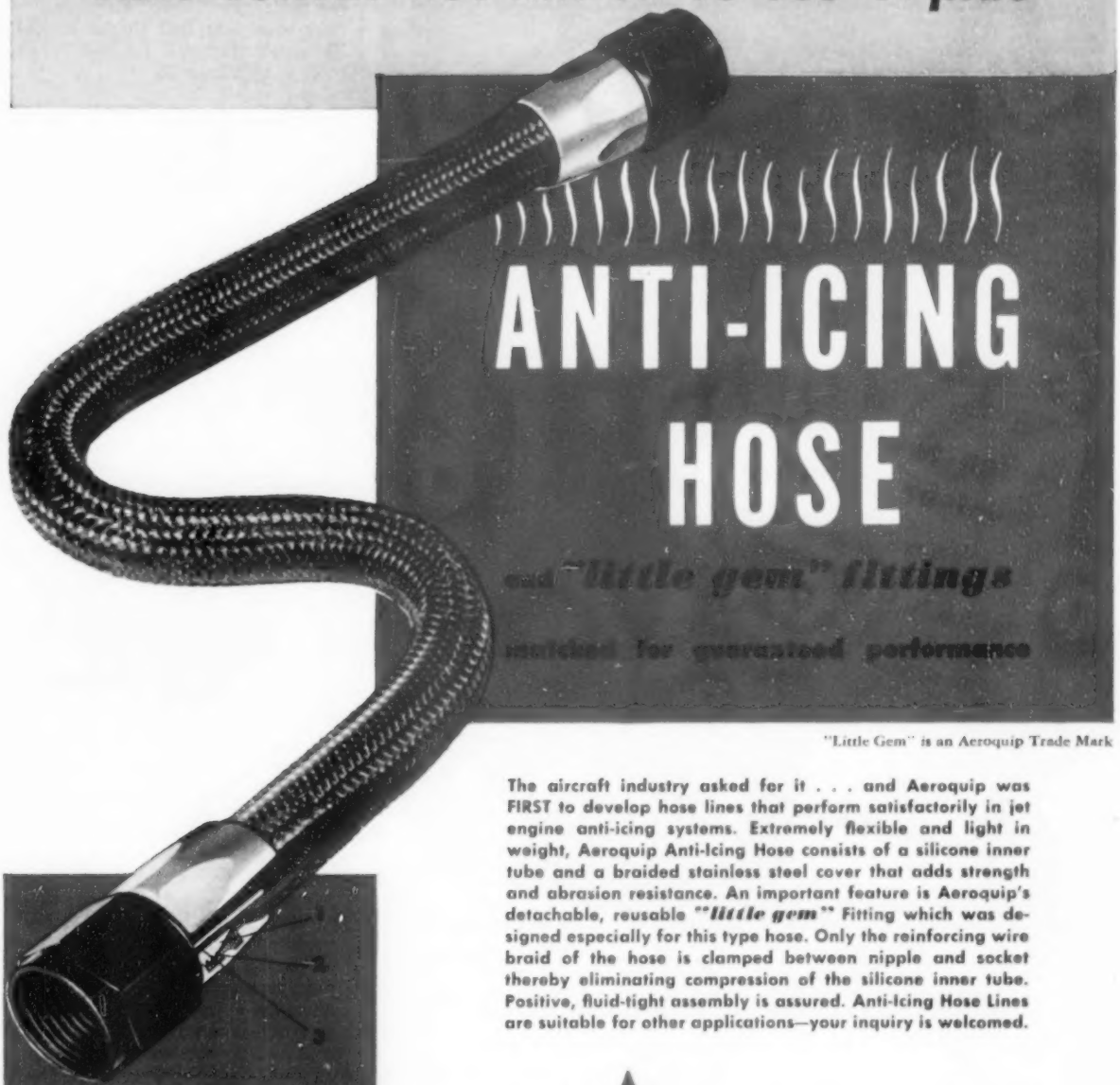

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matically in an emergency. Capable of manual release by the pilot, the unit weighs only 2 lb. complete.—Pacific Scientific Co., 1430 Grande Vista Ave., Los Angeles 23.

Spindown locknut is said to be 1/3 lighter in weight than conventional hexnuts. Of high carbon steel, heat-treated after fabrication, the base of the one-piece nut flattens, forcing six buttress tines into bolt thread to lock.—Thompson-Bremer & Co., 520 N. Dearborn St., Chicago 10.

Fuel pump designed for the refueling systems of large jet bombers weighs less than 4 lb. and can be turned by 1/6 hp. a.c. or d.c. motor. Unit scavenges fuel from the aircraft refueling manifold after transfer is completed. A rotary-vane-type pump, the unit requires no lubrication other than the fuel itself and can be allowed to run dry for short periods, says the maker.—Lear-Romec Div., Elyria, Ohio.

Polaroid pilot light dimmer, specifically designed for CAA for use in radio towers, utilizes the light polarization principle to give continuous and smooth dimming of pilot light intensity from full-on to blackout. Constructed of

non-ferrous material and finished in a non-reflective black oxide. Mounts in a 9/16-27 tapped hole. Accommodates lamps of the NE-51 and No. 47 size.—TLG Electric Corp., 31 W. 27th St., New York 1.

Aircraft torque tube bearing, designed to save weight and space, is built to provide full freedom of rotation under all conditions of misalignment resulting from mounting inaccuracies and flexing of airframe structure. A double-roller type, it has positive seal to retain lubricant and prevent air loss in pressurized aircraft.—Shafer Bearing Corp., Downers Grove, Ill.

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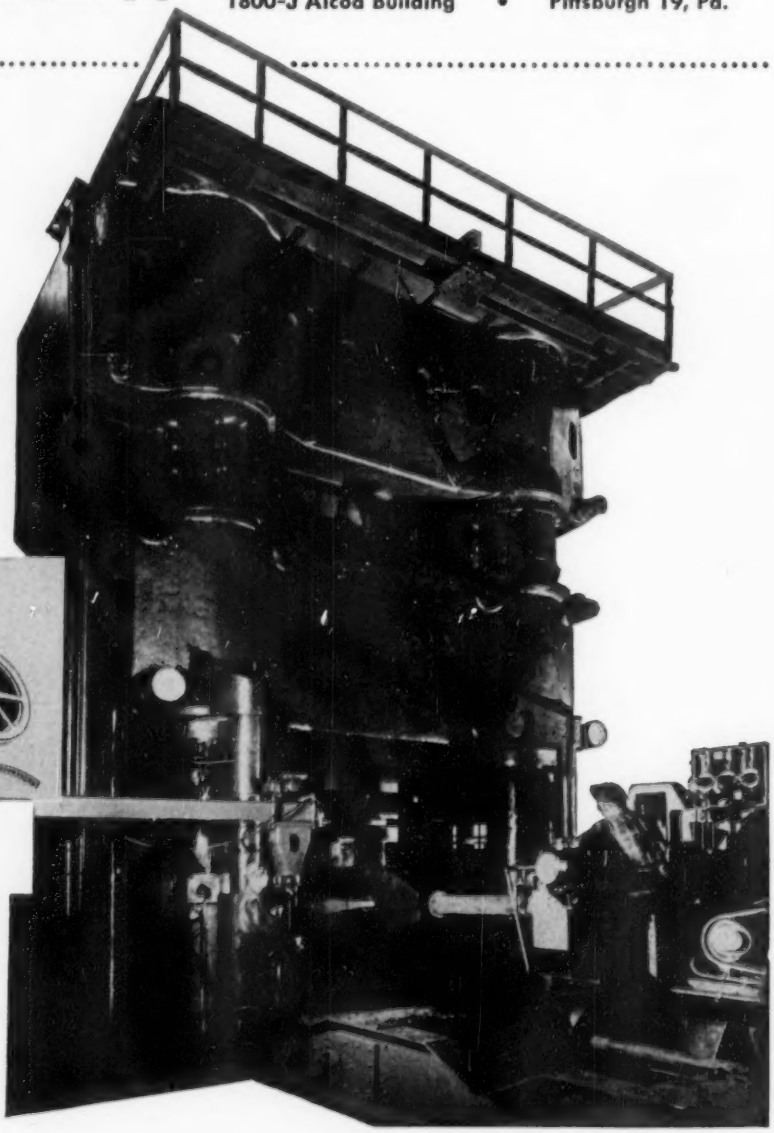

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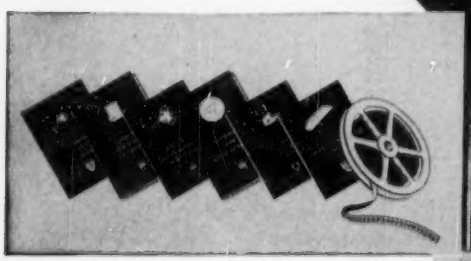

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Income Return on Net Worth

(Calendar 1952)

Trunkline	Dividends (000 omitted)	Net-Worth (000 omitted)	Income Return
American	$4,632(1)	$84,297(1)	5.49%
Chicago & Southern	382	7,815	4.89
Continental	200	3,631	5.52
Delta	525	15,294	3.43
Eastern	1,218	46,489	2.62
Mid-Continent (2)	105	2,192	4.78
National	500	12,330	4.06
Northwest	331(3)	23,353(3)	1.42
United	4,366(4)	86,889(4)	5.01
Western	404	9,382	4.31
Total	**$12,653**	**$291,872**	**4.34%**

(1) Includes dividends of $1,400,000 paid on preferred stock carrying a book valuation of $40,000,000.
(2) Merged with Braniff on August 16, 1952.
(3) Represents dividends paid on preference stock carrying a book valuation of $9,525,625.
(4) Includes total dividends of $691,249 paid on two preferred stock issues. Preferred stock, 1952 series, had a book valuation of $22,046,500 at the year-end.

SOURCE: Company annual reports and CAB recurrent statistics.

Airline Dividends Far From Big

An erroneous impression of liberal dividend payments by the trunk airlines may have been inadvertently created by Robert B. Murray, Jr., Undersecretary of Commerce for Transportation in a recent New York address. This circumstance assumes special significance in view of the series of intensive studies on air transportation now underway by Mr. Murray's office. Profitability of the airlines and their alleged largess to stockholders could figure prominently in these surveys.

In fact, cash disbursements to airline stockholders have been relatively limited and far below the rate of return received by investors in most other industries (AVIATION WEEK Jan. 26, p. 46).

► **Contradictions**—The Undersecretary, in his New York talk at the Wings Club, stated: "More liberal dividends . . . have been paid by the airlines in recent years. In 1952 . . . they paid over $17 million in dividends, or 11.9% of the book value of the capital stock."

Actually, cash dividends by the trunk airlines last year aggregated **$12.65 million** and represented a mere **3.44%** return on the total net worth of the industry.

There are two major disparities inherent in the Undersecretary's dividend statement and they both can be readily isolated and defined.

• Included in Murray's dividend compilation presumably was the 10% stock dividend declared by TWA last year and which was effected on the company's books by a transfer entry of $4,631,677. The fact remains that this action was absolutely without significance as far as income was concerned to TWA shareholders. Moreover, while the TWA stockholder received an additional certificate, the value of his holdings in the company's equity remained exactly the same before and after the stock dividend distribution.

• The second inadvertence in the Undersecretary's dividend statement is in the use of the book value of the industry's capital stock total ($145.1 million) as a base upon which to compute income return. The stockholders' undisputed equity consists of capital stock and all surplus accounts. More often than not most airlines started their corporate existence with a nominal stated capital stock account **plus** paid-in surplus. To this has been added accumulated retained earnings and other accretions achieved throughout the years.

The investor looks to the entire net worth as an indication of book value (with the capital stock account comprising but one element) and it is on this base upon which income return on the stockholders' equity can be evaluated.

Accordingly, the domestic trunklines' aggregate net worth of $367,696,118 as of the 1952 year-end should be used as a base rather than the $145.1 million capital stock figure to compute dividend return on book valuations. The average is thus but 3.44% and not

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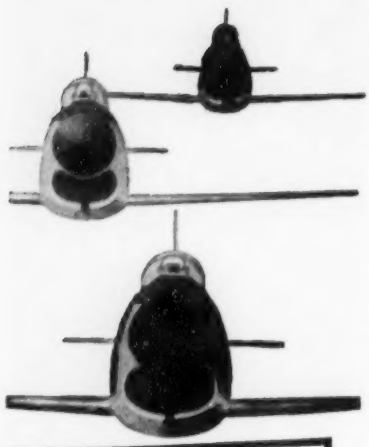

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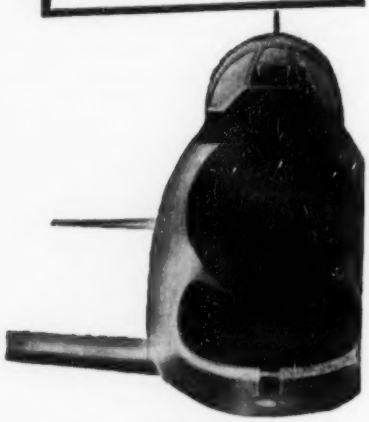

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▶ **Averages Can Mislead**—Industry averages frequently camouflage the wide individual differences that generally exist in any given group. This condition is particularly true in the air transport industry. This is highlighted by the accompanying tabulation showing all cash dividend payments made by the separate airlines during 1952.

It will be noted that Braniff, Capital, Colonial, Northeast, and TWA are completely absent from this list. In other words, airlines with an aggregate net worth of almost $74 million failed to make any cash disbursements to their stockholders last year.

The 10 paying airlines had a combined net worth of $291.7 million at the 1952 year-end and averaged but 4.34% in dividend disbursements to stockholders. Significantly, the aggregate payments of American, United, and Eastern accounted for a total of more than $10.2 million, or 81% of the industry's dividend disbursements last year.

Constant expansion necessary in the air transport industry has necessitated almost continuous reinvestment of available earnings. This has made for token and irregular dividend payments in the past as capital resources were being husbanded.

▶ **Growth Feature**—Further, in the past, airline equities found their principal attraction in the growth qualities and ultimate degree of financial strength being attained. Immediate income remained of minor significance. An important transition, however, is emerging for a number of airlines. It has become increasingly apparent that, to compete for investment consideration among other industrial groups, air carriers must also provide a similar measure of income return to stockholders.

But the air transport industry has yet to build a dividend "history" to leave an impression in investment markets. The 1952 aggregate airline dividend payments were virtually unchanged from the 1951 total and compared with but $6.8 million in 1950, $2.4 million in 1949, and only $1.7 million in 1948.

In a broader sense, it is unfortunate that airline dividends are not much greater than the current experience. Dividends are but a tangible reflection of earnings. Earnings attract investors and enable companies to plow back profits into improved equipment and facilities.

To meet their responsibilities in maintaining a strong air transport network the airlines are in need of a healthy earnings record. As they succeed in this goal, the less will be their dependence upon government supports through grants or subsidies. —**Selig Altschul**

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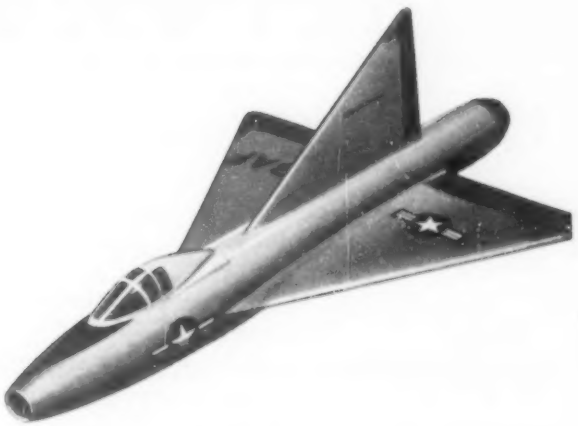

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New Subsidy and Safety Budgets Face Cuts

- **Commerce Undersecretary Murray will roll back CAB payments to local service and international airlines.**
- **CAA will be taken out of local and industry affairs, confined to federal airways service and aviation safety.**

By Lee Moore

Commerce Department will cut Civil Aeronautics Board's subsidy and Civil Aeronautics Administration's safety budgets for fiscal 1955. Both budgets are at the White House, scheduled for decision by December.

The slashes will be made by Robert Murray, Undersecretary of Commerce for Transportation who has direct power over CAA's budget and a special White House mandate to revise the CAB budget—and some Board policies.

Murray's twin-pronged government assignment in civil aviation:

• **Get CAA out** of municipal and industry affairs: make it concentrate almost exclusively on federal airways service and necessary air safety policing. The agency's budget for fiscal 1954 totaled $139 million.

• **Roll back CAB subsidy** to local and international airlines. Subsidies have grown greater while the need for payments diminished, because the Board added new routes faster than old one paid off. CAB's subsidy budget is estimated at $80.7 million for the current fiscal year, $80.3 million for 1955.

▶ **CAB Paring**—Board members sent the 1955 subsidy estimate to White House Sept. 15. It was about the same as this year and substantially higher than any previous year.

Murray announced the next day that cuts must be made and said his staff was giving "intensive" study to this and other CAB policy problems.

Board members immediately met to decide how to make some cuts themselves—rather than wait for the White House and Congress to force them.

Some of their initial plans:

• **Compare airlines.** Cut subsidies of the higher-cost operators to match the lowest on comparable routes. Let investors take the risk of above-minimum expenses that may or may not yield bigger profits. Members cited DC-3 maintenance cost claims of local service airlines, ranging from $17 to $35 per flight hour, and airline promotion expenses of from 15 to 25% of commercial revenues.

• **Eliminate routes** that have not progressed toward self-sufficiency, have little if any national security value and have satisfactory highway or rail transportation available.

• **Force mergers** of some airlines on an "or else" basis. CAB often has proposed mergers to cut subsidy costs but has continued to subsidize mounting costs of carriers that refuse to combine.

▶ **New CAA Economies**—Murray and CAA Administrator Fred B. Lee within 90 days cut the Truman budget from $200 million to $141 million.

Further economies for the fiscal 1955 budget may include:

• **Transfer control tower** to municipal or private support. This will be a gradual, voluntary and negotiated process on important airports. CAA last June summarily dropped 18 towers at fields without sufficient business to meet old or new standards. Policy will be announced by November.

Federal responsibility for airways ends and local airport responsibility begins on the runway, Murray believes.

• **Charge airline,** military and private operators for services received from federal airways. Charges will not be geared to gas tax revenues. Tentative plan will be ready at Commerce within a month.

• **Airport construction aid** also is slated for decision within a month. Federal subsidy to municipalities, if any, will go only to trouble spots. Outlook is that the old multi-million-dollar federal airport program will be scrapped.

• **End business "interference"** by CAA in the name of safety regulation. CAA safety director Al Koch is in accord with the Administration view that government interference should be cut to a minimum.

• **Streamline CAA management.** The Administration already has cut some CAA functions, organizations and personnel. Substantial further reorganization, as well as cutback, is planned.

▶ **Murray Policies**—Some major conclusions that Murray, his deputy, Charles Dearing, and other administration persons concerned with transportation policy have reached so far are revealed by the Undersecretary's recent speech at New York's Wings Club and by exclusive AVIATION WEEK interviews:

• **Trunk airline** aid in direct subsidy and indirect CAA aids "should be withdrawn in an orderly manner" as the industry attains maturity, which most of it has.

• **Feeder and international** subsidy "must be subjected to critical reappraisal."

Murray added in his speech that "these payments have been mounting steadily in recent years with every indication that under present (CAB) policies the outlays will continue to rise."

• **Nonsked competition** with certificated lines must not be allowed to drift without a positive government policy.

The Undersecretary believes half an industry cannot be regulated while the other half is free.

Competitive terms must be roughly equal. Limitation of flight frequency may not work to regulate nonsked competition, because agents pool their sales and reservations.

Murray has not announced a positive policy on the nonsked problem, however. Trunk, nonsked and feeder airline problems are all one, he says, and an overall policy on certification and non-certification must be found soon.

• **Purely local matters** of aircraft and airport finance and operation largely are local, not federal, responsibilities, Murray believes. CAA airport aid and CAB local service airline subsidy grew rapidly and without direction, Murray's staff studies and his own travels and investigations reveal. Federal aid will be cut.

• **International government aid** and interference will be cut under these developing policies.

The Undersecretary found Interna-

Budget Trends

Fiscal Year	CAB Airline Subsidy	CAA Airways & Airports
1951	$75 million	$178 million
1952	71	163
1953	76	149
1954	81	139*

*President Truman asked $200 million; Republicans cut to $141 million; Congress approved $139 million.

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That's the younger generation moving in

Bomber wings at three Strategic Air Command bases are now flying Boeing B-47 Stratojets, and other bases will soon have them. These swift new jets are replacing an older generation of Boeing bombers, the renowned B-29s which during the last war helped write valiant chapters of air history.

The newly equipped Air Force units are headquartered at bases in Florida, Arizona and California. Each unit also has a complement of companion Boeing KC-97 aerial tankers. Other SAC wings, overseas and in the United States, are equipped with Boeing B-50 medium bombers.

The Stratojet flies ten miles a minute, and is capable of operating at altitudes well above 40,000 feet. It's classified as a medium bomber, yet carries a bomb-load of ten tons. Pilots report that it "handles like a fighter."

Revolutionary design gave the Stratojet a performance not previously equalled by aircraft of its dimensions. It was the first bomber to enter the over-600-miles-an-hour class. The B-47's pioneering design, its jewel-like tolerances called for equally advanced manufacturing methods. Those methods were devised and perfected by Boeing production and engineering experts.

Today in its B-47 program, Boeing is turning out even more pounds of aircraft per man-hour than during its World War II production of the B-29s.

Like earlier Boeings the B-47 Stratojet is imaginatively engineered, ruggedly built. It adheres to the uncompromising design and construction standards that, for 36 years, have made the name Boeing stand for dependability.

Boeing is now building a prototype jet transport, designed to be adaptable for either military or commercial use. The new plane has the benefit of Boeing's unparalleled experience in multi-jet aircraft. It will fly in 1954.

BOEING

tional Civil Aviation Organization is getting into more and more matters that he believes should be left to the industry.

Murray fought this trend during the annual ICAO conference last summer and is continuing to work on the problem through the U. S. delegate, Harold Jones (former CAB member).

Cutting international subsidies in some areas will be harder than reducing local service payments because of the impact of foreign competition, Murray's staff believes.

▶ **GOP Policy**—Murray says Commerce Department, under terms of Executive Reorganization Plan 21, now law, is "charged not only with specific duties in the promotion of aviation but with an overall responsibility for developing a sound and coordinated national transportation policy."

"Moreover," he adds "we are obligated in line with general administration policy to seek out every possible budgetary economy in the government's performance of its transportation activities."

President Eisenhower has given Commerce an express go-ahead to use these powers in full. The President has delegated to Commerce much of his substantial additional power in the field of international airline route and subsidy grants.

CAB remains supreme in adjudicatory matters but must answer to the Administration on major policy and budget affairs.

▶ **Red Tape Cuts**—Newest development at CAA is a radical change in safety regulation of airline and private flying under director Koch.

The sprawling network of field agents with narrow, specialized responsibility bound in red tape will be replaced by fewer inspectors with more independence.

Numerical requirements of so many "enroute inspections" of airlines each year will give way to the number of checks an inspector believes is necessary.

Another example: If an inspector cannot decide an engine problem, he will ask the regional engineer's advice. If an airline does not agree with them, they will ask CAA's Washington office to resolve the difference.

The old way, still in effect, imposes on the field agent many "channels" through which to clear decisions and actions through branch, division, region and Washington. First action by Koch eliminated detailed reports of routine checks by agents.

A third example: A CAA inspector granting airman certificates is specialized—one man for airline, another for lightplanes. Safety director Koch says one good man can handle both in many areas.

Main obstacles to quick cleanup of these and other examples of what the present Administration considers unwieldy bureaucracy:

• **Civil Service regulations.** Certain "grades" now require supervision of so many personnel, safety agents often run one-man offices. Handing them more responsibility and pay often may require reworking of ironbound Civil Service laws.

• **Impact of reductions.** Aim is to cut personnel as much as possible through normal job turnover—no hiring of new men. However, threat of reductions will have to be used to speed resignations on occasion.

Airlines and private operators will have to be taught to assume more responsibility, too, the new administration acknowledges. But rapid transition to minimum red tape in CAA regulation is a certainty.

CAB ORDERS

(Week of Sept. 14-20)

GRANTED:

Pan American-Grace Airways amendment of exemption for special flight to include South Bend, Ind., for passengers to visit Notre Dame University.

Central Airlines immediate start of service to Lawton-Fort Sill, Okla.

Northern Consolidated Airlines permission to stop Alaska service on a route duplicating that of Wien Alaska Airlines. This route includes service to Fairbanks, Circle Springs, Fort Yukon and Beaver.

Bonanza Airlines subsidy increase of $216,194 per year. CAB member Josh Lee dissented, as he did on a recent Southwest Airways increase, on grounds the Board has urged Bonanza merger with Southwest—which would be saving the taxpayer at least as much per year as these increases.

Trans World Airlines permission to suspend direct trans-Atlantic route to interior points, Chicago and Detroit, during the slack winter season, Sept. 27-June 1.

Trans World Airlines trans-Atlantic temporary mail-rate increase of $776,000 a year, effective Oct. 1. CAB's temporary subsidy-and-mail rate yielding TWA $3,268,000, was that much lower than the airlines compensatory mail rate (without subsidy) alone. CAB soon will set a final subsidy rate for TWA.

Northwest Airlines special permission to serve Pusan, Korea, as well as Seoul and Tokyo, for which it is certificated.

Ozark Air Lines route renewal case: intervention by various civic bodies; Central Airlines permitted to amend its applications in this case. CAB also denied Kentucky Department of Aeronautics petition to dismiss from this case the question of whether Eastern Air Lines service should be suspended at Owensboro, Ky.

Northeast Airlines permission to suspend service to Rockland, Me., in the winter season Sept. 26-May 31.

Philadelphia Chamber of Commerce intervention in N. Y.-Chicago route case. Northwest Airlines is granted its request to withdraw a route application in this same order.

ORDERED TRANSFERRED:

Scheduled airline mail pay compensation to Post Office, with no subsidy included. This gives effect to Presidential Reorganization Plan No. 10. Starting Oct. 1, Post Office pays for cost of mail carriage only (including "reasonable" profit element thereon). CAB pays subsidy.

REPEALED:

Economic regulation restricting nonskeds

IATA SEEKS TO IMPROVE RATE PROCEDURES

More efficient and streamlined procedures for international agreements by the airlines on rates matters is being sought by the new traffic advisory committee of the International Air Transport Assn. shown at their initial meeting in London. The group is preparing for the next IATA traffic conference to be held in Honolulu in November. Dennis H. Handover, of Scandanavian Airlines System, has been elected chairman of the new committee. Shown, left to right: Phillip Lawton, BEA; O. E. Cocke, TWA; Michel de Villeneuve, Air France; W. M. Sheehan and E. S. Pefanis of IATA; Handover; J. W. S. Brancker, newly appointed IATA traffic director; V. de Boursac, IATA; Willis G. Lipscomb, PAA; Dr. F. von Balluseck, KLM and Ray W. Ireland, UAL, who will preside over the Honolulu meetings. Other members of the committee not shown here are: Charles N. Biondi, Philippine Air Lines and S. K. Kooka, Air India International.

to three trips a month between major cities. Regulation was tied up in the courts, and will be moot anyway at the end of the large irregular carrier investigation.

APPROVED:

Routine inter-airline agreements among 27 groups of parties.

DENIED:

United Air Lines petition for reconsideration of CAB decision Portland-Seattle service case. United had asked and been denied rights to fly direct Spokane-Portland, Seattle and eastern points. United admits it would divert $1.4 million a year from Northwest, but says Northwest won increased rights that would yield $879,000 itself. CAB says the net $524,000 diversion from Northwest is still too much.

Bonanza Airlines motion for consolidation in its route renewal case of a complaint against Southwest Airways, claiming that Southwest practices some unlawful operations at Inyokern, Calif.

United Air Lines and Pan American World Airways petition that CAB suspend nonsked Transocean Air Lines' reduced fares between California and the Hawaiian Islands (Honolulu and Hilo).

DISMISSED:

General Airways from states-Alaska route case, at request of the company.

Flying Tiger Line and Slick Airways reduced rates for C-46 aircraft charter flights. Carriers canceled the tariffs.

SUSPENDED:

American Airlines coach with first-class rates between New York, Washington and Boston. Rates were suspended June 10, and this order renews the suspension while CAB completes its investigation. CAB insists that coach flights must have coach rates, even on short-haul segments.

Air France to Start Chicago-Paris Flights

Air France will link midwest United States and Europe with direct service Oct. 21, flying Constellations from Chicago via Montreal to Paris, Frankfurt, Milan and Rome.

In announcing the new service last week, the French airline said 62-passenger, Turbo Compound-powered Super Connies will be operated on first-class flights to Paris and Frankfurt.

Tourist Constellations will fly 60-passenger service from Chicago to Paris, with through flights on to Milan and Rome.

UAL Radar

Results of United Air Lines airborne radar tests, to be announced soon, will give new 5.7-cm. wavelength a decided edge over older 3.2-cm. in its ability to see through heavy thunderstorms. UAL test results, which reportedly exceeded fondest hopes of 5.7-cm. proponents, should enable airlines to proceed with preparation of radar specifications, which had been halted pending decision on the best radar wavelength.

CAB Kills Nonsked Flight Regulation

Civil Aeronautics Board has repealed the economic regulation restricting nonsked airlines to three trips a month between any pair of major cities and eight a month between small cities.

The controversial "three-and-eight" regulation, stayed by the courts in American Air Transport vs. CAB, was killed before it took effect.

The Board gives two major reasons for repeal:

- **Present nonsked investigation** has numerical flight frequency restrictions as a major issue. Settlement of this case will replace the old regulation.
- **Protracted litigation** in court therefore will serve no useful purpose.

The Board concludes that "since that regulation has never become effective as to any carrier, its repeal is regarded as a formality, the only effect of which will be to relieve the government and the two carrier parties to the litigation of a substantial burden."

The nonskeds contended the regulation would have restricted their former freedom and curtailed profits or forced losses without right of adjudicatory hearing.

Bonanza Subsidy Climbs $220,000

Civil Aeronautics Board members apparently are reversing their lineup on subsidy policy.

Republicans are spending more money, while at least one Democrat is trying to stem the trend toward increased payments established under 15 years of Democratic control.

▶ **$220,000 Increase**—Board majority granted a $220,000 subsidy increase to Bonanza Airlines. Democrat Josh Lee —CAB's most ardent supporter of the local service experiment—filed a strong economy dissent, as he recently did in a similar case on Southwest Airways.

Lee says if the two local service carriers had merged, as CAB urged them to do, subsidy increases would not have been necessary.

▶ **Whittled Raise**—Bonanza's new rate is set to yield the airline $907,803 a year in subsidy plus $40,000 compensation for cost of hauling airmail. It is effective from last Apr. 30 forward.

The carrier claimed it would need $1,022,742 to break even. The Board whittled this down to $908,585 plus $39,218 for profit.

▶ **"Unnecessary Burden"**—Highlights of Lee's dissent to the Bonanza subsidy increase:

"This increase of approximately $220,000 annually . . . constitutes an unnecessary burden on the public treasury. . . . When the Board launched the local service experiment, it was with the full knowledge that the operations would require subsidy. It was hoped, however, that the amount of subsidy required per plane mile of operation could be and would be gradually reduced.

"For a period of time this hope was realized . . . but during the past 17 months it has been necessary for the Board to increase the mail pay, either on a temporary or permanent basis, of every local service carrier in the industry . . .

"It has been difficult to justify these increases even though they were made necessary through no fault or failure of the managements of the carriers. But such is not the case with respect to Bonanza and Southwest. The failure of

EXCALIBUR FLIES AGAIN

Vought-Sikorsky VS-44A Excalibur, once the property of the former American Export Airlines, has been refurbished in Baltimore by Aviation Exchange Corp. and recently was test flown. According to Hugh Wells, head of AEC, the VS-44A is to be flown to South America where it will be used for cargo-transport flights in connection with mining activities. Powered by four P&WA R1830s, the remodeled VS-44A has accommodations for approximately 15 passengers and six tons of freight.

these two carriers to merge their operations and thereby substantially reduce their reliance upon the government is not a cause beyond their control."

▶ **Merger Savings**—"I believe their failure to do so does not constitute 'economical and efficient management' within the meaning of the Civil Aeronautics Act. The instant proceeding which increases Bonanza's mail rate clearly shows the unnecessary burden which the government is required to support.

"For example, on the single item of maintenance expense, Bonanza sought recognition of an allowance of $33.28 per hour. This was reduced somewhat and an allowance has been made for maintenance expense equivalent to $30.50 per hour.

"But even this is grossly in excess of the amount the government would be required to pay if the two carriers were merged because Southwest's maintenance expense amounts to only $19.82 per hour.

Los Angeles Protests Air Route Arguments

Los Angeles—Chamber of Commerce of Los Angeles is protesting State Department's seeming preference of San Francisco as a terminus for foreign airlines flying mid-Pacific routes.

William B. Coberly, Jr., chairman of the chamber's Air Transportation Committee, says agreements have been concluded with both Japan and the Philippines for trans-Pacific routes terminating at San Francisco.

"It appears that our State Department is consummating air agreements without due consideration of the No. 1 city on the West Coast," he says. "These agreements apparently were completed with no public announcements and with no effort made to advise interested parties on the West Coast."

The chamber official says Japan Air Lines had reported that "the biggest factor responsible for our selection of San Francisco as the terminal is the air agreement which does not include Los Angeles as a terminal point."

SHORTLINES

▶ **AiResearch Aviation Service Co.**, Garret Corp. subsidiary, cut price of Douglas DC-3 trim-tab modification by $500 due to its volume of this business. Company says it has the only such modification approved for use with all autopilot installations.

▶ **Air Transport Assn.** has changed the

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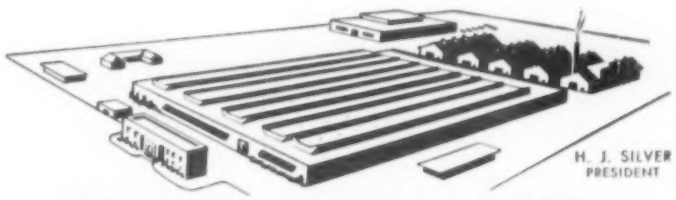

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name of its committee on helicopters to "ATA Committee on Rotocraft," to include convertiplanes.

▶ **Bombay International Airport,** Santa Cruz, India, soon will get new ILS landing equipment. A terminal building will be completed next year, and new lighting facilities are being installed. Poona and Ahmedabad are slated to become weather alternate airports for Bombay International, following meteorological studies indicating that when Santa Cruz is closed, Poona is open 75% of the time and Ahmedabad 80%.

▶ **Canadian Pacific Airlines** expects to have delivery of both its Douglas DC-6A cargo planes this month for all-cargo service Vancouver-Montreal via Edmonton, The Pas and Toronto (see p. 62). If the Canadian Air Transport Board meanwhile denies CPA's transcontinental cargo application as urged by competitor Trans-Canada, the company plans to sell the DC-6As (bought for $2.5 million).

▶ **Capital Airlines** has sponsored a network television show—the daily Dave Garroway program on NBC, with informal commercials. The 13-week contract specifies that no other airline sponsor shall be taken during the period.

▶ **International Civil Aviation Organization** admits Japan as its 61st member nation Oct. 8, two years after signing of the Japanese peace treaty.

▶ **Lake Central Airlines** reports passenger boardings increased nearly 60% the first eight months this year compared with last year.

▶ **Northwest Orient Airlines** reports a record 14,577 passengers boarded at Seattle-Tacoma Airport in August, compared with 12,078 a year ago. . . . Company changed its Anchorage, Alaska, service from Elmendorf AFB to its new $375,000 installation at Anchorage International Airport. . . . NWA converted its Stratocruiser and DC-4 land evacuation equipment from ropes to new vinyl-coated fiber glass chutes at the main doors. Ropes may be carried also.

▶ **Pan American World Airways** increased service to Caracas, Venezuela, from four to 10 flights a week Sept. 1, switched from Constellations to DC-6Bs.

▶ **United Air Lines** reports August set an all-time record of 4,350,000 revenue passenger-miles, up 10% from the same month a year ago.

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Readable Reasoning

The engineering and safety bulletins, minutes of committee meetings, accident reports, notices, memos, directives and other papers which continually pour from aviation groups at times give the industry more an air of a literary society than of an organization actually devoted to the movement of airplanes.

These documents are read, of course, for the information they contain or sometimes simply because they are required reading. However, when scanning this paper pile, one cannot help making comparisons between styles and judging the literary plane of each. Those which **sound** accurate and sensible are read and remembered. Others which appear dull and are boring may quickly be discarded.

►**Not Shakespeare**—Also important, albeit unfortunate, is the fact that the reader may translate dull writing into author stupidity. There obviously is just so much that can be done with a technical engineering report and nobody expects it to rival Shakespeare & Co. But this philosophy doesn't make it any easier to get beyond the first paragraph.

So it is a special pleasure when a document appears which is both technically accurate and highly readable. You feel you have found something worthwhile.

Of such supreme stuff is the report of the fifth technical conference of International Air Transport Assn. held at Copenhagen in May 1952 (although just recently distributed). It relates to the problems effecting final approach and landing.

Admittedly this is a subject near and dear to this author. It long has been felt here that the purpose of aviation is to move airplanes, and since pilots might be called the "prime mover" the solutions to some problems would come easier if they were attacked from the operational view. IATA seems well acquainted with this practical thought.

►**A Pilot's View**—The entire tone of the meeting, as portrayed through the minutes, indicates these people want no nonsense. They know the problems of flying an airplane and talk about them in plain English. Recognizing that landing a modern transport is a ticklish business under certain conditions they figure that if the pilot's job is made easier, then everybody will benefit. What a wonderful outlook!

There also is the distinct impression in these pages that here was a meeting devoid of the usual political overtones, the whispered conference, the hurried phone call, the stalling speech, the temperizing view and compromised conclusion. These people actually said what had to be said because it was the truth. Three cheers!

General objective of this meeting was to "increase safety and the chance of approach success in marginal weather conditions." They also wanted to "insure that the development and utilization of systems for instrument approach and landing are based on sound principles and operating procedures."

Frankly it is a novel experience to see the emphasis put on safety in sound operating procedures. Usually laboratory safety—under controlled conditions—is deemed good enough for everyday usage.

►**Good Ideas**—This report is the type that should be seen more often, for it has appeal. Few organizations come close to the calibre of the thinking expressed here, regardless of field of endeavor, and the readable language used in presenting the ideas is good.

In a subsequent article I will pick significant parts of this work to illustrate the practical outlook of this IATA group. It would not be amiss, however, for everyone connected with aviation to read (study would be better) this report.

AVIATION CALENDAR

Sept. 28-30—Ninth annual meeting, National Electronics Conference, Hotel Sherman, Chicago.

Sept. 29-Oct. 1—American Institute of Electrical Engineers, middle eastern district meeting, Daniel Boone Hotel, Charleston, W. Va.

Sept. 29-Oct. 3—SAE National Aeronautics Meeting, Aircraft Engineering Display and Aircraft Production Forum, Hotel Statler, Los Angeles.

Sept. 30-Oct. 2—Aircraft electric equipment conference, American Institute of Electrical Engineers, Benjamin Franklin Hotel, Seattle.

Sept. 30-Oct. 2—Series of seminars on transonic testing in windtunnels, Purdue University, Lafayette, Ind.

Oct. 1-3—Air Reserve Assn.'s annual convention, Angebilt Hotel, Orlando, Fla.

Oct. 5-9—International Air Transport Assn., general meeting, Montreal.

Oct. 9-23—National Safety Congress and Exposition, Chicago. Aeronautical industries section will be held at the Hamilton Hotel, air transport at the Conrad Hilton.

Oct. 10—England-Christchurch (New Zealand) air race.

Oct. 13-15—Air Transport Assn.'s annual Engineering and Maintenance Conference, Saxony Hotel, Miami Beach, Fla.

Oct. 14-15—Annual airport development and operation conference, sponsored by New York Dept. of Commerce, Onondaga Hotel, Syracuse, N. Y.

Oct. 15-16—Aircraft Electrical Society, 10th annual display meeting, Pan-Pacific Auditorium, Los Angeles.

Oct. 21-23—National Metals Congress, City Auditorium, Cleveland.

Oct. 22-23—Radio Technical Commission for Aeronautics, 1953 fall assembly, Sheraton Park Hotel, Washington, D. C.

Oct. 23—National Advisory Committee for Aeronautics, annual meeting, Illinois University Institute of Technology, Champaign, Ill.

Oct. 23-24—Fourth annual National Noise Abatement Symposium, Armor Research Foundation of Illinois Institute of Technology, Chicago. Airplane and airport noise will be discussed by NACA's H. H. Hubbard.

Oct. 28-30—Southeastern Airport Managers Assn., annual convention, Marlin Beach Hotel, Ft. Lauderdale, Fla.

Nov. 3-4—1953 Transport Aircraft Hydraulics Conference, sponsored by Vickers, Inc., Hotel Park Shelton, Detroit.

Nov. 4-6—Society of Automotive Engineers, meeting of committee on aircraft hydraulic and pneumatic equipment, Statler Hotel, Washington, D. C.

Nov. 17-18—Operations Research Society of America, first regular meeting, National Bureau of Standards, Washington, D. C.

Nov. 17-20—Aviation Distributors and Manufacturers Assn., 11th annual meeting, Jefferson Hotel, St. Louis.

Nov. 19-21—National Aviation Trades Assn., 14th annual convention, Hotel Broadview, Wichita.

Dec. 17—Seventeenth Wright Brothers Lecture, U. S. Chamber of Commerce building, Washington, D. C.

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EDITORIAL

Alex McSurely

The tributes to Alex McSurely, printed on this page, speak for themselves. Most of the writers must have felt keenly their own inadequacy to express their deep feelings about a man who seems to have won the affectionate respect of almost everyone he ever knew in aviation.

Alex was an understanding friend and a gifted associate. All of us on the staff know now that we relied upon him more than we ever realized before.

He had a wide knowledge of aviation—which he loved—and he knew hundreds of people in it.

Alex, in his quiet, unassuming manner possessed all the attributes of a fine newspaperman. His integrity was unquestioned. He was the only reporter that the late Orville Wright would talk to and trust.

In the 10 years that some of us knew Alex, we never heard anyone in aviation utter a word of criticism about Alex, the man. Such an accomplishment in life is rare, indeed.

Alex's name will be left on AVIATION WEEK's masthead indefinitely, as a memorial to a beloved staff member and a recurring reminder of the kind of journalism he not only stood for but actually achieved.

—R.H.W.

Dear Bob:

It's difficult to tell how shocked we all were to hear of Alex's sudden passing. He loved life and had such a zest for living that it's hard to think of him in any other way than doing his job and seeing his friends at the National Press Club.

I think the plan which has been worked out for a McSurely Scholarship in lieu of flowers is wonderful and I am enclosing checks which are some slight token of our feelings toward Alex and the McSurelys. Perhaps later when things settle down a bit, some of us who knew him should get together and see if we can't figure out a way of helping the children more substantially.

Sincerely yours,
WAYNE WEISHAAR, Secretary,
Aeronautical Training Society,
Washington, D.C.

With great shock, I read the news in this week's issue of AVIATION WEEK regarding Alex McSurely's death.

Over the years that I knew him, I came to have great respect and affection for him. In every respect, Alex typified the best in aviation journalism.

His many friends and the industry will miss him sorely.

RUSSELL NEWCOMB
Simmonds Aerocessories, Inc.
Tarrytown, N.Y.

We who make aviation a career share with you your loss in the untimely death of Mr. Alexander McSurely who has served AVIATION WEEK so well as a writer on topics in aviation.

It was my privilege to know Mr. McSurely personally and to have talked to him during his recent visit to Dayton. His knowledge of the broad field of aviation and his high journalistic principles brought great respect to him and the publication he served.

Please accept my deep sympathy.

E. W. RAWLINGS,
Lieutenant General, USAF
Commander, Air Materiel Command
Wright-Patterson Air Force Base
Dayton, Ohio

Alex McSurely's passing was a great shock to us out here, and I wish to extend my sympathy to you and your "editorial family" whom Alex loved so well.

ERWIN G. MORRISON, Colonel, USAF
Public Information Officer
Air Materiel Command
Wright-Patterson Air Force Base
Dayton, Ohio

Shocked to hear of untimely passing of your inimitable Alex McSurely. He always was one of the most capable aviation reporters in the nation and will be sadly missed by all of us. His many friends at Boeing join me in offering sincere condolences.

HAROLD MANSFIELD, Director,
Public Information & Advertising,
Boeing Airplane Co.
Seattle 14, Wash.

We were shocked and saddened to learn of Alex's passing. Please wire his home address and funeral arrangements.

LAWRENCE F. ZYGMUNT, President
General Aircraft Supply Corp.
Detroit 5, Mich.

I just learned the shocking news of Alex McSurely's death. It is difficult for me and my associates here at Bell to express our feelings relative to Alex's passing. I think you well know that he was an old and dear friend of mine as well as everyone in our company. Please express our deepest sympathy to his family.

JAMES C. FULLER
Bell Aircraft Corp.
Fort Worth 1, Texas

Deeply shocked and deeply regret most untimely death of Alex McSurely one of aviation's greatest friends, an extraordinary gentleman and certainly a wonderful person. AVIATION WEEK's loss is reflected by the entire industry.

FRANCIS W. DUNN, Director,
Public Relations
Bell Aircraft Corp.
Post Office Box 1
Buffalo 5, N.Y.

We were all shocked to learn from Joe Geuting this morning that Alex McSurely passed away at his brother's home in Cincinnati, Tuesday morning.

I was very fond of Alex and he certainly had the reputation in our industry as a man who did an objective and accurate job of reporting. His death is surely a loss to the industry.

I'd appreciate your giving me his wife's address, as I would like very much to drop her a note.

DWANE L. WALLACE, President
Cessna Aircraft Co.
Wichita 1, Kan.

News of Alex's death came as a deep personal shock. He was an excellent reporter. In the kind of world where he and I felt most at home, this is the highest praise.

CLAUDE O. WITZE,
Manager, Public Relations
Piasecki Helicopter Corp.
Morton, Pa.

Memorial Fund

Friends of Alex in Washington who were unable to send flowers to the memorial service sought some manner of expressing their regard for him. They have established a fund to assure a college education for the McSurelys' three children. Alex's close friends knew that planning for his children's education had been his biggest project in recent years, and the ambition closest to his heart.

An account in a Washington bank has been opened in the name of "The Alexander McSurely Scholarship Fund," and contributions are being made payable to that fund, addressed to 1189 National Press Building, Washington, D.C., where members of AVIATION WEEK's Capital staff will process them for the bank and notify the widow, Mrs. Gertrude McSurely, of each such offering.

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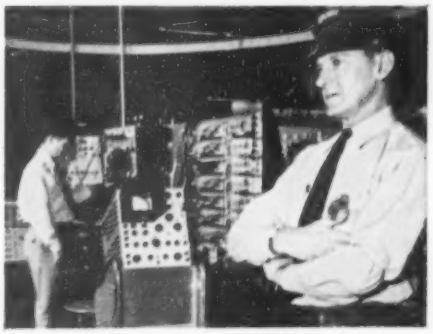

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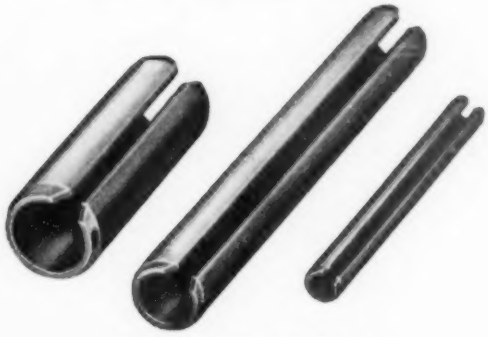

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